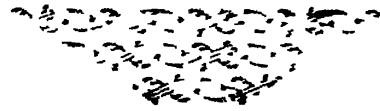


*To inspire ambition, to stimulate
the imagination, to provide the
inquiring mind with accurate
information told in an interest-
ing style, and thus lead into
broader fields of knowledge
such is the purpose of this work*



The **BOOK of** **KNOWLEDGE**

VOLUME

8

The
BOOK
of
KNOWLEDGE

*A Pictorial Treasury of Reading
& Reference for Young and Old*

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seven hundred of them in colour and gravure**

**Edited by
GORDON STOWELL**

**Advisory Editor
J. EDWARD MASON**
M.A., M.Ed.
Director of Education for Nottinghamshire

VOLUME

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**Through the Year : Study Outlines
EASY REFERENCE FACT-INDEX
Picture Quiz : "Careers" Addresses**



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THE BOOK OF KNOWLEDGE

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THROUGH THE YEAR with The Book of Knowledge

THIS unique Calendar will enable you to use **THE BOOK OF KNOWLEDGE** in such a way as to relate appropriate items of information to a particular day—indeed, to every day in the year, if your fancy lies that way. It thus provides an opportunity for you to gain all kinds of useful general knowledge in an easy and entertaining way; and if you were to do it regularly, it would solve for a whole year the perpetual problem of "What shall I read?" Although such a method of using **THE BOOK OF KNOWLEDGE** has not the consistent purpose of that suggested for those who use the "Study Outlines" given in the next section of this volume, it is certainly far more rewarding than a desultory turning over of the pages day after day without any particular object in view. All the references in the Calendar give the number of the volume first in black-face type, and this is followed by the number of the page of that volume in which the appropriate information is to be found. Thus 7-243 means that you should take Volume 7 and turn to page 243. Nature Notes for each month are also given. Those for January will be found on the next page.



JANUARY

- 1** **NEW YEAR'S DAY**, 5-409. Bank Holiday in Scotland.
1308 William Tell's revolt began, 7-255; Switzerland, 7-213.
- 1484** Zwingli, Protestant reformer, born, 7-528; Reformation, 6-377.
- 1502** Gonçalves entered bay of Rio de Janeiro, 6-402
- 1785** *Daily Universal Register* (later *The Times*) founded. Newspapers, 5-406.
- 1804** Napoleon's *Code Civil* published. Napoleon I, 5-318; France - History, 3-452.
- 1808** U.S.A. forbade importation of slaves. Slavery, 1-134.
- 1901** Commonwealth of Australia inaugurated, 1-312. British Commonwealth, 2-83.
- 1947** U.K. coal-mines nationalised. Coal, 2-428; Labour Party, 4-427; Mines, 5-215; Socialism, 7-81; United Kingdom, 7-354.
- 2** **17** Ovid, Roman poet, and Livy, Roman historian, died. History, 4-181; Latin, 4-451; Livy, 4-527.
- 1492** Granada, last Moorish stronghold in Spain, recaptured by Spaniards, 4-59; Spain, 7-104.
- 1905** Port Arthur surrendered to the Japanese. Japan, 4-350; Russia, 6-472.
- 1947** Cupro-nickel coins issued in U.K. to replace silver. Alloy, 1-115; Mint, 5-223; Money, 5-233.
- 3** **106** B.C. Cicero, Roman orator, author, and statesman, born, 2-387; Latin, 4-450.
1521 Martin Luther excommunicated, 5-53; Christianity, 2-380; Reformation, 6-376.
- 1840**, Father Damien, missionary to leper island of Molokai, born, 3-34.
- 1883** Clement Richard Attlee, British statesman, born, 1-306; Labour Party, 4-427; Socialism, 7-81. United Kingdom, 7-354.
- 4** **1492** Columbus sailed from America to Spain in the *Niña*, 2-467; America, 1-132.
1813 Sir Isaac Pitman, of shorthand fame, born. Shorthand, 7-43.
1895 Capt. Dreyfus, condemned for treason, sent to Devil's Island. Jews, 4-373.
1948 Burma became an independent republic, 2-130; British Commonwealth, 2-84.
- 5** **1066** Edward the Confessor died. Edward, Kings of England, 3-166; English History, 3-276.
1589 Catherine de' Medici died. Coligny, 2-453; France - History, 3-450; Medici, 5-160.
1896 First demonstration of X-rays given by Rontgen. Medicine, 5-161; X-rays, 7-507.
1919 Kingdom of Serbs, Croats, and Slovenes established. European History, 3-316; Serbia, 6-532; Yugoslavia, 7-519-20.
- 6** **FRASER OF THE EPIPHANY. TWELFTH NIGHT.** Christianity, 2-379; Christmas, 2-381.
1879 Roberts captured Kandahar. Afghanistan, 1-47; Roberts, 6-414.
1916 Allies began evacuation of Gallipoli. Turkey, 7-334; World Wars, 7-480.

JANUARY

Nature Notes Snow or sun, or dull dank mist, or aullen rain, or earth-binding frost, may be predominant in the New Year. Whatever the circumstances, never does the great outdoors lack interest. A white earth-carpet is patterned with dainty footprints of food-seeking birds; but the early worm is beyond reach. For earthworms (3-153) burrow deeply to escape the cold. Bolder imprints are made by scurrying rabbits (6-328), and hares (4-132), and other non-hibernating mammals. Weighted down under the white burden, the branches of yew trees (7-513) and other evergreen conifers (2-183) have a fairyland effect, especially when viewed in the silent moonlight. If sunshine be but a fitful gleam through leafless trees, it lights up the long reddish-brown male catkins of the alder (1-97) and of the birch (1-130). The swaying catkins might be passed unnoticed; not so the "real" flowers on a larger scale. Welcome indeed are the snowdrops (7-78) and the earliest crocuses (2-333), engendering as they do the deceptive belief that spring is close at hand! The thin but penetrating little song of the robin (6-115) offers fine encouragement, too, as does the wildly tuneful music of the mistle-thrush (7-271) poured from a swaying tree-top in stormiest weather. Indoors, a warm fire wakens to too early activity a tortoiseshell butterfly (2-145) that had gone to sleep in a dark corner, bidding for safety in hibernation (4-173).

7 1450 University of Glasgow founded. Glasgow, 4-28; University, 7-368.

1610 Galileo discovered the satellites of Jupiter. 3-498; Astronomy, 1-280; Jupiter, 4-386, 387. Planets, 6-212; Telescope, 7-248.

1785 English Channel first crossed by air (Blanchard and Jeffries). Balloon, 1-354.

1922 Anglo-Irish treaty ratified. Ireland, 4-281. United Kingdom, 7-352.

8 1337 Giotto, Italian painter, died, 4-21; Italy. Art of, 4-317; Renaissance, 6-386.

1679 La Salle, French explorer, reached Niagara Falls. Great Lakes, 4-69; Niagara Falls, 4-69.

1775 John Baskerville, British printer, died. Birmingham, 1-474; Type and Typography, 7-341.

1886 Severn Tunnel opened. Railways, 6-357. Tunnels, 7-328.

1918 President Woodrow Wilson issued his Fourteen Points for world peace, 7-456; United States History, 7-362



Jan. 8, 1679. Niagara Falls in North America, first reached by Jean Baptiste de La Salle, celebrated French explorer.

9 1816 Davy's safety lamp first used in coal mine. 3-54; Lamps, 4-442; Mines, 5-215.

1920 Last of Kolchak's White Russian troops surrendered to Bolsheviks. Russia, 6-172.

1945 U.S. forces landed on Luzon. Philippines, 6-156

10 1645 Archbishop Laud beheaded, 4-453. Charles, British Kings, 2-306.

1838 Wren's Royal Exchange burnt down. Lloyd's, 4-532; London, 5-21.

1840 Penny postage introduced in Britain Post Office, 6-270; Stamps, 7-144.

1863 Metropolitan Railway opened. London, 5-19. Underground Railways, 7-345.

1920 Covenant of League of Nations came into force. 4-463; European History, 3-316. Geneva, 3-511. United Nations, 7-354; World Wars, 7-483.

11 1753 Sir Hans Sloane, British physician and collector, died. British Museum, 2-88. Museum, 5-299

1923 French began occupation of the Ruhr, Germany; History, 4-9; World Wars, 7-186.

1928 Thomas Hardy, novelist and poet, died, 4-131. English Literature, 3-291; Novel, 5-170.

1945 Russian troops entered Warsaw, 7-419; Poland, 6-240. World Wars, 7-496

12 1628 Charles Perrault, French author, born. Blue Beard, 1-494. Children's Books, 2-354.

1729 Edmund Burke, British author, orator, and statesman born, 2-129; English Literature, 3-288. Pitt, William, 6-208.

1746 J. H. Pestalozzi, Swiss educational reformer, born. Education, 3-166.

1879 Zulu War began. South Africa, 7-91. Zulus, 7-527.

1933 Russia's second Five-Year Plan announced. Russia, 6-476.

13 1399 Delhi captured and plundered by Tamerlane, 3-66; India, 4-239; India: History, 4-254; Mongols, 5-237.

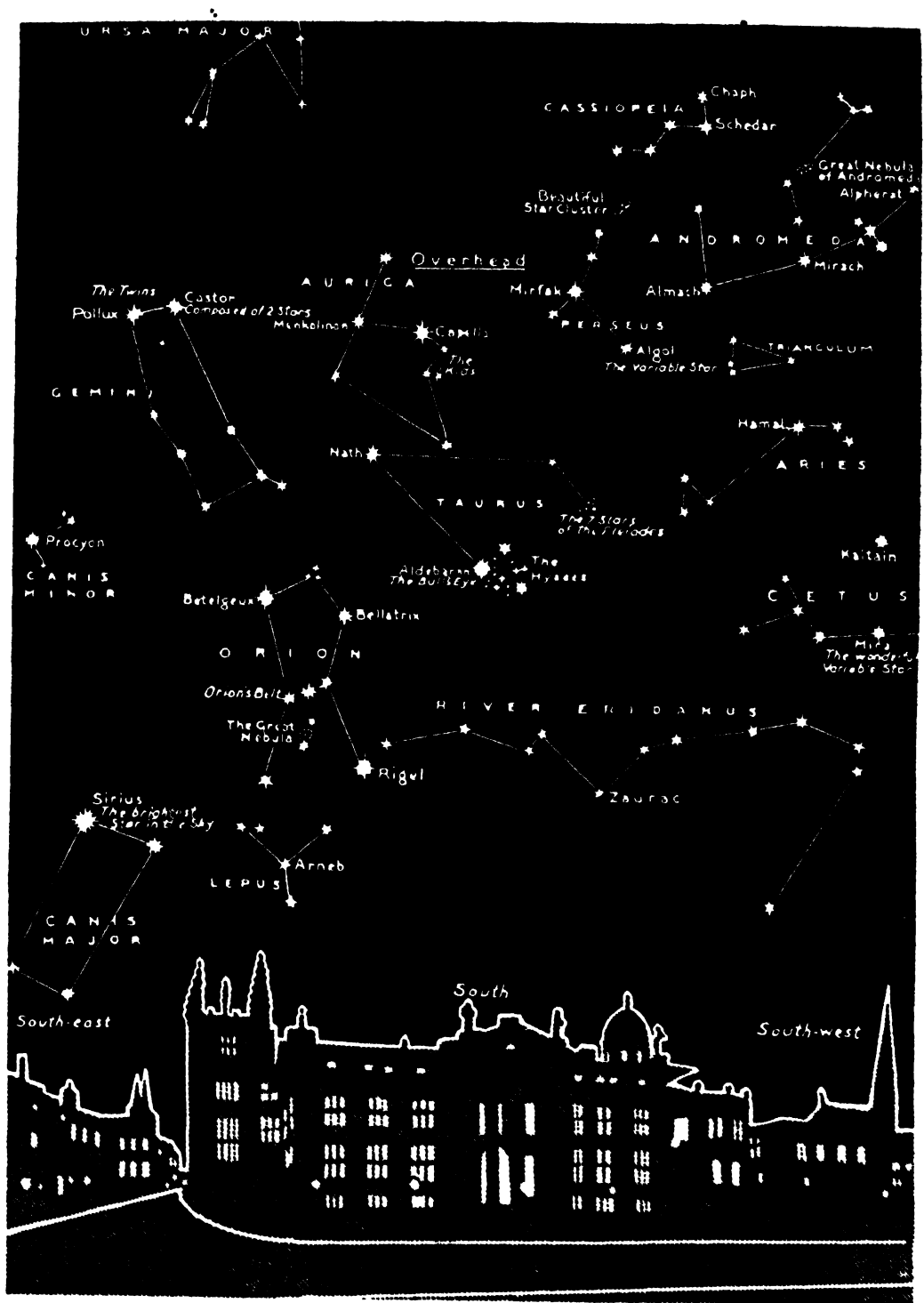
1848 Hudson's Bay Company acquired Vancouver Island, British Columbia, 4-200. British Columbia, 2-82.

1935 Saar voted by plebiscite to return to Germany. Germany, 4-1.

14 1667 Pietro Francesco Cavalli, Italian pioneer in opera, died. Opera, 5-513.

1742 Edmund Halley, English astronomer and student of comets, died. Comets, 2-168; Gravitation, 4-65; Star, 7-147.

JANUARY



THE STARS IN JANUARY. Here we give the first of a series of charts showing how to read the stars month by month. They are shown as they appear at about 9 p.m. (Greenwich Time) in the middle of the month and about four minutes earlier each succeeding evening. With this map you can study the stars from the middle of January to the middle of February. You are looking southward in Oxford towards Hertford College and the Bodleian Library, but the stars are seen in virtually the same positions, looking south, from all parts of Britain.

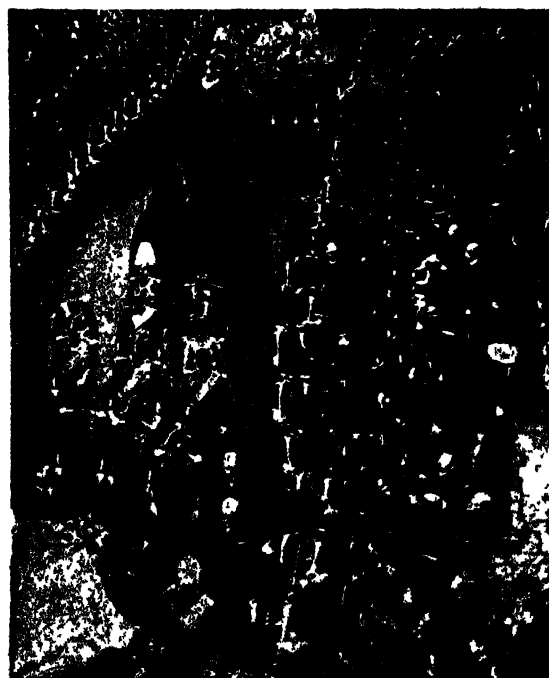
JANUARY

1898 Charles Lutwidge Dodgson ("Lewis Carroll"), author of *Alice in Wonderland*, died, 2-251; Children's Books, 2-356.
1923 Speeches broadcast by radio in New York distinctly heard in England. Radio, 6-340.

15 1759 British Museum opened, 2-88; Library, 4-486; Museum, 5-299.
1778 Captain Cook discovered the Hawaiian Islands. Cook, 2-494; Hawaiian Islands, 4-139; Pacific Ocean, 6-29.
1878 University of London admitted women to degrees. London, University of, 5-33.

16 1599 Edmund Spenser, English poet, died, 7-130; English Literature, 3-284.
1809 Battle of Corunna and death of Sir John Moore. Moore, Sir John, 5-259; Napoleon I, 5-318; Peninsular War, 6-117.
1913 Irish Home Rule Bill passed House of Commons. Ireland, 4-281; United Kingdom, 7-351.

17 1600 Pedro Calderón de la Barca, Spanish dramatist, born. Drama, 3-119; Spanish Literature, 3-119.
1706 Benjamin Franklin, American scientist, born, 3-460; Electricity, 3-310, 211; Kites, 4-505. Lightning, 4-505; Spectacles, 7-126.
1863 David Lloyd George, Welsh statesman, born, 4-531; Liberal Party, 4-485; United Kingdom, 7-351, 352.
1871 Earl Beatty, British admiral, born, 4-390; Jellivoe 4-359; Jutland, Battle of, 4-390; World Wars, 7-491.
1920 Prohibition of alcoholic drinks came into force throughout United States. Alcohol, 1-96; Chicago, 2-335; United States: History, 7-362.



Jan. 32, 1901. Death of Queen Victoria at Osborne. Above, the funeral procession is seen on its way to Windsor

18 1486 Lancastrians and Yorkists reconciled by marriage of Henry VII and Elizabeth of York. Edward, Kings of England, 3-167; Henry, Kings of England, 3-277; Roses, Wars of the, 6-454.

1535 Lima, capital of Peru, founded by Pizarro. Lima, 4-507; Peru, 6-138; Pizarro, 6-211.
1561 Sackville and Norton's *Gorbuduc*, first English tragedy, performed. English Literature, 3-284.
1871 German Empire proclaimed in Hall of Mirrors, Versailles. Bismarck, 1-475; Germany: History, 4-5; Versailles, 7-394.
1912 Captain R. F. Scott reached South Pole, 6-515-517; Diary, 3-86; Polar Exploration, 6-244.
1943 Siege of Leningrad raised, 4-470; World Wars, 7-493.

19 1350 Order of the Garter instituted by Edward III. Knighthood, 4-418; Orders and Decorations, 5-530.
1729 William Congreve, English dramatist, died. Drama, 3-121; English Literature, 3-287.
1736 James Watt, British engineer, born, 7-431; Boiler, 1-504; Industrial Revolution, 4-260; Steam Engine, 7-153.
1848 Gold discovered in California. California, 2-178; Gold, 4-38.
1853 Verdi's opera *Il Trovatore* first played at Teatro Apollo, Rome. Opera, 5-520.
1915 First raid by Zeppelin airships on England. Airship, 1-82, 83.

20 1265 First English parliament met in Westminster Hall. English History, 3-277; Parliament, 6-88.
1649 Trial of Charles I begun, 2-306; Cromwell, Oliver, 2-534; English History, 3-278-79.
1790 John Howard, English prison reformer, died. Prisons, 6-291.
1841 Hong Kong ceded to Britain by China, 4-191; China, 2-361.
1900 John Ruskin, English art critic and sociologist, died, 6-471; English Literature, 3-291.
1936 Death of George V and accession of Edward VIII, 3-522, 3-169; United Kingdom, 7-352.

21 1793 Louis XVI of France guillotined, 5-40; France, History of, 3-451; French Revolution, 3-466; Marie Antoinette, 5-126.
1824 "Stonewall" Jackson, U.S. Confederate general, born, 4-333; Lincoln, Abraham, 4-511.
1887 Henry M. Stanley started the relief of Emin Pasha, 7-144.
1924 Vladimir Ilyitch Lenin died, 4-478. Russia, 6-476.
1936 Bolivia and Paraguay signed Gran Chaco peace treaty. Bolivia, 1-507; Paraguay, 6-76.

22 1561 Francis Bacon, English Lord Chancellor, author, philosopher, born, 1-340; English Literature, 3-285; Physics, 5-162.
1720 "South Sea Bubble" speculation began in London. Bank of England, 1-302; Walpole, Sir Robert, 7-417.
1788 Lord Byron, English poet, born, 2-147; English Literature, 3-289; Hero, 4-170.
1879 British victory over Zulus at Isandhlwana. Zulus, 7-527.
1901 Death of Queen Victoria and accession of

JANUARY

Edward VII, 7-395-96; Albert, Prince Consort, 1-92; United Kingdom, 7-351.
1944 Allied landings at Anzio, Italy World Wars, 7-494.

23 1579 Dutch Republic founded. Netherlands, 5-380.
1790 Mutineers of the *Bounty* burned their ship at Pitcairn Island. *Bounty*, 2-27; Pacific Ocean, 6-31.
1883 Gustave Dore, French illustrator, died. Cervantes (*Don Quixote* story), 2-295-97 (3 pictures); Samson, 6-495 (picture).
1900 Battle of Spion Kop. Boer War Boer War, 1-502.
1924 Ramsay MacDonald took office as Britain's first Labour premier. Labour Party, 4-427; MacDonald, J. R., 5-61, United Kingdom, 7-352.
1943 Eighth Army entered Tripoli. Alamein, 1-87; Montgomery, 5-252, World Wars, 7-493.

24 41 Roman Emperor Caligula assassinated, 2-178; Rome: History, 6-437.
1236 Henry III of England married Eleanor of Provence. Henry, Kings of England, 4-162.
1749 Charles James Fox, British politician, born, 8-426; Pitt, W., 6 208.
1891 First train crossed the Forth Bridge. Bridge, 2-64.
1915 British naval victory at Dogger Bank. North Sea, 5 460
1916 First conscription bill (Military Service Act) passed by House of Commons. Army, 1 245-48; United Kingdom, 7 352.

25 1533 Henry VIII married Anne Boleyn. Boleyn, Anne, 1 506; Henry, Kings of England, 4 163, 164.
1627 Robert Boyle, English chemist, born, 2-32 (picture), Chemistry, 2-316; Gases, 3-505-10 (picture).
1759 Robert Burns, Scottish poet, born, 2-132. English Literature, 3-288; Scotland: Language and Literature, 6-514.
1874 William Somerset Maugham, English novelist and dramatist, born. English Literature, 3 291

26 1788 Sydney founded, 7-216. Australia, 1-317; New South Wales, 5-402.
1885 Khartoum captured by Mahdi and Gordon killed. Egypt, 3-178; Gordon, 4 48. Khartoum 4 402. Kitchener, 4-415; Sudan, 7-179.

27 1756 Wolfgang Amadeus Mozart, Austrian composer, born, 5-289. Music, 5-305; Opera, 5-514, 516.
1879 Patent for first electric lamp taken out. Edison, 3 165. Electric Light and Power, 3-220; Lamps, 4 402.
1926 John L. Baird demonstrated television before the Royal Institution. Television, 7-254.
1943 Siege of Stalingrad raised by Russian forces, 7-142; Germany: History, 4 11; Russia, 6-476; World Wars, 7-493

28 814 Charlemagne died at Aachen (Aix-la-Chapelle), 2-305; Aachen, 1-1; Germany: History, 4 5; Holy Roman Empire, 4-187; Middle Ages, 5 190.



Jan. 23, 1943. Tank troops of the British Eighth Army having entered Tripoli, cheer the hoisting of the Union Jack

1596 Sir Francis Drake died aboard his ship off Nombre de Dios, West Indies, 3 113; America, 1-134; Armada, 1 240. Hawkins, 4-142. Navy, 5-354; Oregon, 5-532. Plymouth, 6-229.

29 1737 Thomas Paine, British political writer, born, 6-320.
1768 Goldsmith's comedy, *The Good-natured Man*, produced at Covent Garden, 4-42.
1833 Reform Parliament opened. Parliament, 6-88. United Kingdom, 7-349.
1856 Victoria Cross instituted Orders and Decorations, 5 29.

30 1649 Charles I executed, 2-306. Charles British Kings, 2 307; Cromwell, Oliver, 2-534. English History, 3 278.
1805 Mungo Park started on his second African voyage, 6-86; Africa, 1 54. Niger, 5-434.
1826 Telford's Menai Suspension Bridge opened. Telford, 7-255; Anglesey, 1 150. Bridge, 2 67. Roads, 6 407.
1933 Adolf Hitler became Chancellor of Germany, 4 181. European History, 3 317; Germany: History, 4-10. National-Socialism, 5-328. World Wars, 7-485.
1948 Gandhi assassinated by Hindu fanatic, 3 501. India: History, 4 254.

31 1797 Franz Schubert, Austrian composer, born, 6-507; Music, 5-305.
1839 Durham Report on Canada presented. British Commonwealth, 2-83; Canada, 2 200
1846 Corn Laws repealed by Peel, 6 105. Bright, 2 60; Cobden, 2-435; Customs and Excise, 3 12. Ireland, 4 282; United Kingdom, 7 370
1858 Steamship *Great Eastern* launched Brunel, 2 99; Cable, 2-154.
1915 First Zeppelin airship raid on London. Air ship, 1 83, 84.



FEBRUARY

Nature Notes Fallen leaves may rustle dry and crisply, for 'February fill dike' does not always live up to its moist reputation. When they lie sodden and slippery underfoot and the ditches are indeed running with water, frogs (3-472) begin to show by eerie croaking that they have had enough of sleep these past months and are almost ready to begin laying chains of jelly-like eggs. Where ground is not waterlogged, fresh mounds of soil indicate where moles (5-11) are tunnelling. Overhauled in the branches squirrels (7-140) are out and about, there is only a partial hibernation, and if really hard weather closes in again they will probably go back to sleep. Deeper slumber lies upon the hedgehog (4-153) and even violent disturbance will scarcely waken it before the month is out. The first brimstone butterfly (2-140) flickers like a scrap of windblown paper. The chaffinch (3-352) sings, robust and heartening and high in the blue sky lark (4-147) trills. Near to earth the hedge-sparrow (1-123), and the yellow bunting or yellowhammer (2-124) match their songs against the melodious whistle of the blackbird (1-177). A raucous note is struck by the rooks (6-411) noisily building or rebuilding nests in the swaying tree tops. Here and there among branches where they clamber is a haze of subdued colour: purple where the early elm (3-237) flowers show. Dusty (3-27) speckle the turf, they like shepherd's purse (7-20) are in flower at nearly all times of the year. In hedgerow and thin woodland hazel (4-113) catkins hold promise of next autumn's nuts.

- 1** 1708 Castaway Alexander Selkirk discovered on Juan Fernandez island. Crusoe, Robinson, 3-2.
- 1884** First volume of the *Oxford English Dictionary* appeared. Dictionary, 3-48.
- 1896** Puccini's opera *La Boheme* first played at Teatro Regio, Turin. Opera, 5-513, 518, 520.
- 1924** Great Britain recognized government of the U.S.S.R. Russia, 6-472, United Kingdom, 7-347.
- 1953** Disastrous floods in the Netherlands, 5-377.
- 2** 1461 Yorkists defeated Lancastrians at Battle of Mortimer's Cross. English History, 3-275, Roses, Wars of the, 6-453.
- 1536** Buenos Aires founded by Pedro de Mendoza, 2-108, Argentina, 1-223, South America, 7-96.
- 1882** James Joyce, Irish author, born. English Literature, 3-291, Irish Republic, 4-287, Novel, 5-473.
- 3** 1399 John of Gaunt, Duke of Lancaster, died, Roses, Wars of the, 6-453.
- 1807** British captured Montevideo, 5-251, South America, 7-96, Uruguay, 7-370.
- 1809** Felix Mendelssohn-Bartholdy, German composer, born, 5-169, Music, 5-302, Midsummer Night's Dream, 5-200.
- 1945** Berlin bombed in daylight by over 1,000 aircraft. Berlin, 1-432.
- 4** 1881 Thomas Carlyle, Scottish historian and sociologist, died, 2-243, English Literature, 3-290.
- 1945** Yalta Conference on occupation of Germany opened. Churchill, 2-355, Roosevelt, F.D., 6-449, Stalin, 7-141.
- 1948** Ceylon Independence Act came into force, 2-297, British Commonwealth, 2-84.
- 5** 1788 Sir Robert Peel, British statesman, born, 6-105, Customs and Excise, 3-12, Police, 6-247, United Kingdom, 7-347.
- 1840** Sir Hiram Maxim, Anglo-American inventor, born. Aeroplane, 1-27, Machine Gun, 5-63.
- 1934** Corporative state established in Italy. Fascism, 3-342, Italy, 4-304.
- 6** 1665 Anne, Queen of Great Britain, born, 1-158, English History, 3-281, United Kingdom, 7-347.
- 1840** NEW ZEALAND DAY, commemorating Treaty of Waitangi, ceding New Zealand to British Crown. British Commonwealth, 2-82, New Zealand, 5-422.
- 1946** Sarawak ceded to Britain, 6-408, Borneo, 2-19.
- 1952** Death of George VI, accession of Elizabeth II. 3-233, George, Kings of Great Britain, 3-523.
- 7** 1478 Sir Thomas More, English statesman and writer, born, 5-262, Renaissance, 6-394.
- 1812** Charles Dickens born, 3-80, English Literature, 3-283, Novel, 5-472.
- 1941** British Army of the Nile captured Benghazi. World Wars, 7-489.
- 8** 1587 Mary Queen of Scots beheaded, 5-141, Elizabeth I, 3-231, James, Kings of Great Britain, 4-338, Knox, 4-424, Scotland, 6-512.
- 1828** Jules Verne, French writer of scientific romances, born, 7-393, Children's Books, 2-354.

FEBRUARY

- 1894** R. M. Ballantyne, British author of boys' books, died. *Children's Books*, 2-356.
1927 Bishops' proposed changes in Church of England prayer book issued. *Prayer Book*, 6-280.

- 9** **1473** Nicolaus Copernicus, Polish astronomer, born, 2-501; *Astronomy*, 1-278; *Galileo*, 3-498; *Planets*, 6-212.
1865 Robert E. Lee, U.S. general, assumed command of all the Confederate armies, 4-474.
1941 Germans occupied Bulgaria, 2-119.

- 10** **1567** Lord Darnley, husband of Mary Queen of Scots, murdered. *Mary Queen of Scots*, 5-141.
1763 Canada annexed to Britain by Treaty of Paris, 2-199; *British Commonwealth*, 2-82.
1775 Charles Lamb, English essayist, born, 4-440; *English Literature*, 3-290.
1899 United States and Spain signed peace treaty. *Cuba*, 3-6; *Spain*, 7-109; *United States: History*, 7-362.
1906 British battleship *Dreadnought* launched at Portsmouth. *Navy*, 5-342.

- 11** **1658** René Descartes, French philosopher, born, 3-77; *Philosophy*, 6-158.
1836 London University founded, 5-33; *Education*, 3-166; *University*, 7-367.
1892 Pike's Peak, Colorado, made a forest reserve. *Colorado*, 2-461; *Rocky Mountains*, 6-424.
1929 Lateran agreement between Italian government and the papacy. *Vatican*, 7-383.

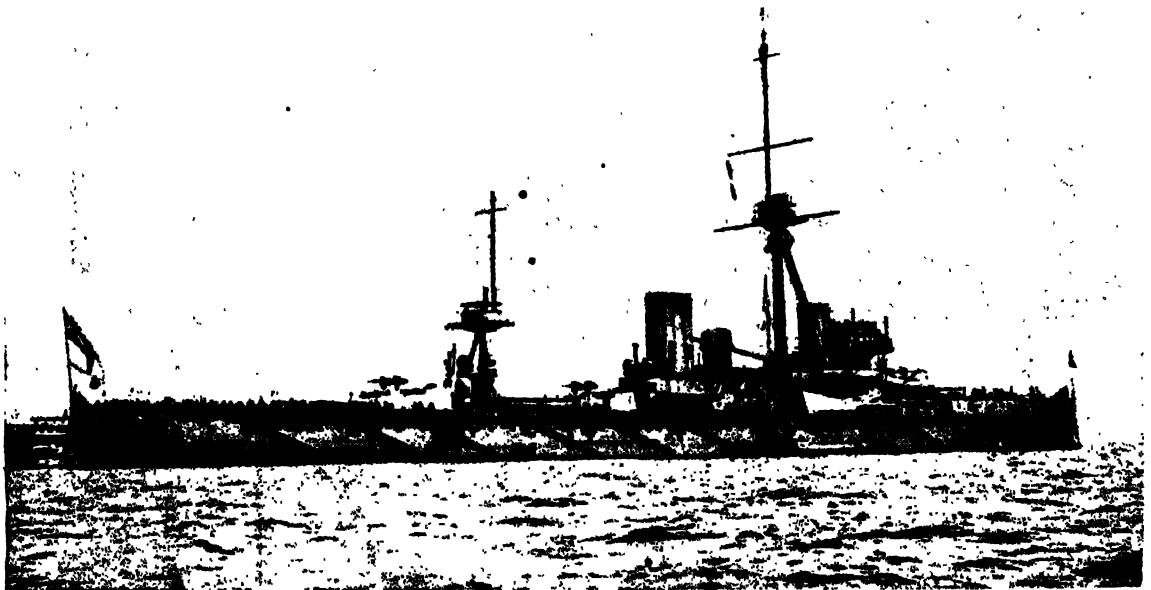
- 12** **1554** Lady Jane Grey beheaded, 4-97; *Mary, Queens of England*, 5-140; *Reformation*, 6-377.
1809 Charles Darwin, English biologist, born, 3-51; *Ecology*, 3-158; *Evolution*, 3-321; *Heredity*, 4-166; *Huxley*, 4-212; *Zoology*, 7-527.



Feb. 9, 1473. Nicolaus Copernicus, Polish astronomer, who discovered that earth and planets revolve round the sun.

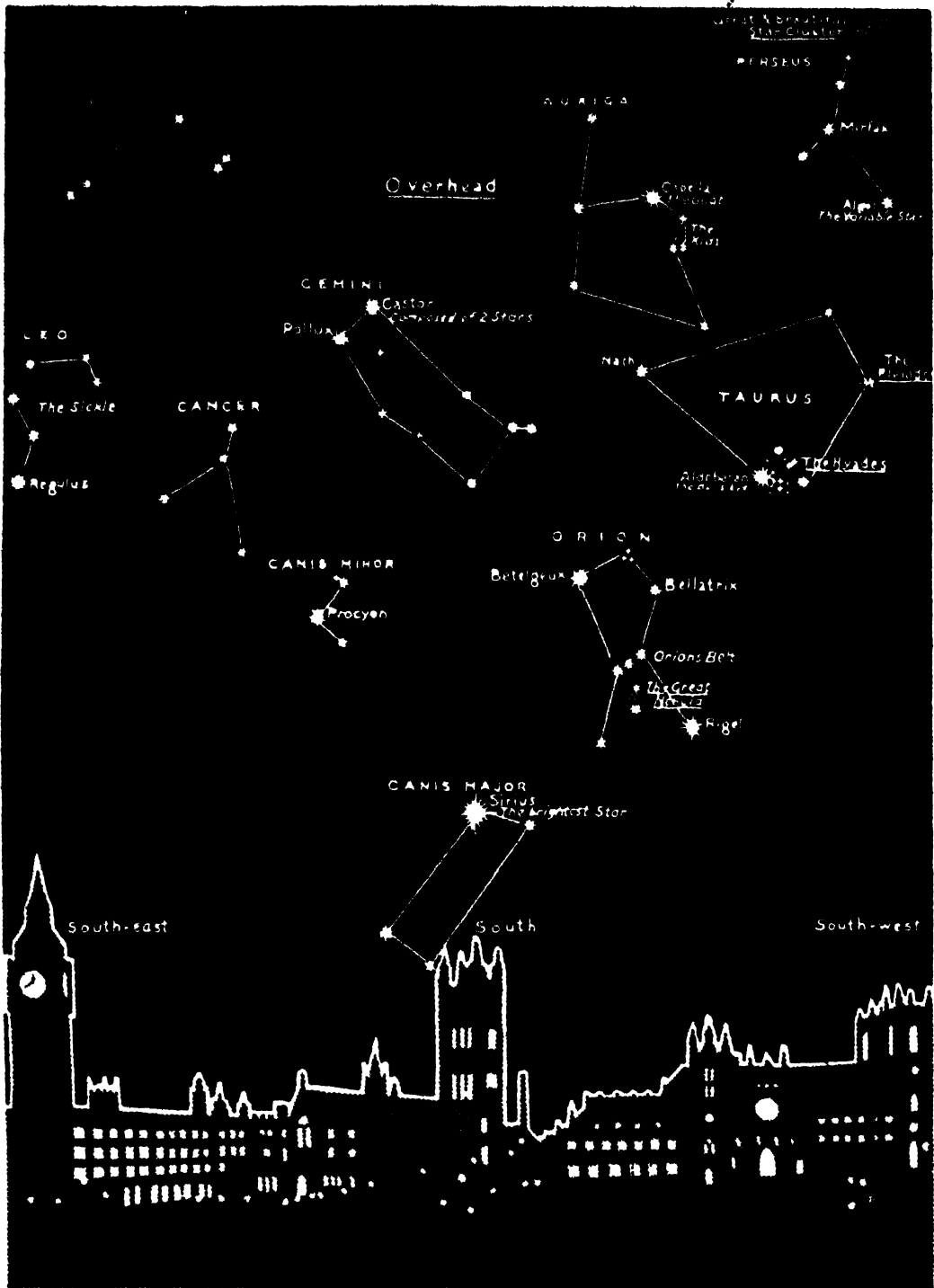
- 1809** Abraham Lincoln born, 4-511; *Slavery*, 7-65.

- 13** **1692** Massacre of Glencoe. *Argyllshire*, 1-227; *Scotland*, 6-514 (picture).
1728 John Hunter, English anatomist, born, 4-208; *Anatomy*, 1-143; *Medicine*, 5-161; *Surgery*, 7-194.



Feb. 10, 1906. The name *Dreadnought* has been borne by first-class ships of the Royal Navy almost continuously since 1573. The ninth *Dreadnought* (above) was the forerunner of the modern battleship. Her normal displacement was 17,900 tons, her speed was 21 knots, and she was equipped to repel torpedo-craft. The cost of construction amounted to almost £2,000,000.

FEBRUARY



THE STARS IN FEBRUARY With the aid of this picture any boy or girl in Britain can study the stars between the middle of February and the middle of March. You are supposed to be standing in Parliament Square, Westminster, facing south, with the Houses of Parliament and Westminster Abbey ahead. The thin lines join up the stars of each constellation. The objects underlined, such as the Great Nebula in Orion, should be looked at through a telescope or, if that is not available, through field- or opera-glasses steadied against a wall.

FEBRUARY



Feb. 15, 1564. Galileo Galilei, Italian astronomer and physicist. His telescope created a revolution in astronomy.

- 1788** Trial of Warren Hastings began at Westminster Hall, 4 136; Calcutta, 2 172; India: History, 4 251.
- 1867** Strauss's waltz "The Blue Danube" first played, at Diana Hall, Vienna. Strauss, J., 7-172.
- 1914** Alphonse Bertillon, French criminologist, died. Fingerprints, 3 353; Police, 6-427.

14

ST. VALENTINE'S DAY, 7 371.

- 1912** Yuan Shi kai became first President of the Chinese Republic. China, 2-375.
- 1928** Prince of Wales appointed Master of the Merchant Navy. Edward, Kings of England, 3 169; Merchant Navy, 5-171.
- 1946** Bill to nationalise the Bank of England received royal assent, 1 361; Banks and Banking, 1-363; Labour Party, 4 427; Money, 5-233; Socialism, 7-81.

15

1564 Galileo Galilei, Italian mathematician and astronomer, born, 3-498; Astronomy, 1-280; Gravitation, 4 66; Pendulum, 6-114.

- 1763** Seven Years' War ended by Peace of Hubertusburg, 7-2; India: Hist., 4 251; Quebec, 6 321; United Kingdom, 7 347; Wolfe, 7-465.
- 1874** Sir Ernest Shackleton, British explorer, born, 7-10; Antarctica, 1-103; Polar Exploration, 6-242; Scott, Robert Falcon, 6-515.
- 1900** Relief of Kimberley. Boer War, 1-502; Rhodes, Cecil, 6 393; South Africa, 7-88.
- 1942** Singapore surrendered to the Japanese, 7-56; World Wars, 7 491.

16

1517 Gaspard de Coligny, French Protestant leader, born, 2-453; Huguenots, 4-201; Medici, 6-160; Reformation, 6-377.

- 1822** Sir Francis Galton, English anthropologist, born. Fingerprints, 3 353; Heredity, 4 166.

- 1932** De Valera's *Fianna Fáil* party won Irish general election, 3-81; Irish Republic, 4-284.
- 1936** Spanish "Popular Front" won general election. Spain, 7-103.

17

- 1405** Tamerlane the Great, Mongol chieftain, died. Mongols, 5 238; Persia, 6 132 (Marlowe's tragedy *Tamurlaine*, Marlowe, 5-133).
- 1564** Michelangelo, Italian artist, died, 5-190; Italy: Art, 4 317; Painting, 6-33; Renaissance, 6-384; Sculpture, 6 520.
- 1766** Thomas Robert Malthus, British economist, born. Economics, 3-160; Food, 3-411.
- 1856** Heinrich Heine, German-Jewish poet, died. Germany: Literature, 4-13; Jews, 4 373.
- 1923** Lord Carnarvon opened inner tomb of King Tutankhamen, at Luxor. Egypt, Ancient, 3 183; Pyramids, 6 312.

18

- 1516** Mary I, Queen of England, born, 5 140; Elizabeth I, 3 230; Henry VIII, 4-163; Philip II (Spain), 6 155.
- 1745** Alessandro Volta, inventor of voltaic cell, born. Battery, 1-386; Electricity, 3-210.
- 1775** Thomas Girtin, English painter, born. English Art, 3 261.
- 1915** German submarine blockade of Great Britain began. Atlantic Ocean, 1 293; World Wars 7 481.

19

- 1717** David Garrick, British actor, born. Goldsmith, 4 42; Johnson, Samuel, 4 379; Lichfield, 4-491.
- 1924** International Drug Convention signed at Geneva. Drugs, 3-127; Opium, 5-521.
- 1945** U.S. Marines landed on Iwojima, Japan, 4 340; Pacific Ocean, 6 25; World Wars, 7 498.



Feb. 19, 1945. A group of U.S. Marines (above) plant the Stars and Stripes on the Japanese island of Iwojima

FEBRUARY



Feb. 23, 1792. Sir Joshua Reynolds, whose self-portrait is seen above, greatly enriched the art of English portraiture

- 20** 1765 Almack's Assembly Rooms, St. James's London, opened, 1-116.
 1803 Kandy, Ceylon, captured by British, 2 297.
 1809 Battle of Saragossa. Peninsular War, 6 116.
 1810 Andreas Hofer, Tirolese patriot, shot. Innsbruck, 4-263.

- 21** 1863 London mail-bags carried by pneumatic conveyor. Pneumatic Machines, 6 231.
 1901 Cuba became a republic, 3 6.
 1916 Germans began assault on Verdun. Pétain, 6-144 World Wars, 7-479.

- 22** 1512 Amerigo Vespucci, Italian navigator, died. America, 1-132.
 1810 Frédéric François Chopin, Polish composer, born, 2 378; Piano, 6-195.
 1819 Spain ceded Florida to the United States, 3-393; Spain, 7-109; United States: History, 7 361.
 1946 Dr. S. A. Waksman announced discovery of streptomycin. Antibiotics, 1-175.

- 23** 1633 Samuel Pepys, English diarist, born. Charles II, 6-121; Charles, British Kings, 2-306; Diary, 3 86; English Literature, 3-287.
 1792 Sir Joshua Reynolds, British portrait painter, died, 6 389; English Art, 3 263; Johnson, Samuel, 4-360; Painting, 6 36.

- 24** 1500 Charles V, Holy Roman Emperor, born. Germany: History, 4 8; Holy Roman Empire, 4-187.
 1877 Avonmouth Dock opened. Bristol, 2-73.

- 25** 1570 Queen Elizabeth I excommunicated by the Pope, 3-230; English History, 3-277; Pius, 6-209.
 1841 Pierre Firmin Auguste Renoir, French Impressionist painter, born. France: Art, 3-449; Impressionism, 4-237.

- 26** 1802 Victor Hugo, French poet, novelist, and dramatist, born, 4-200; France: Literature, 3-453; Novel, 5-472.
 1815 Napoleon escaped from Elba before the "Hun-

- dred Days," 5-318; Louis, Kings of France, 5-40; Wellington, Duke of, 7-437.
 1845 Buffalo Bill (W. F. Cody), American pioneer and showman, born, 2-100.
 1852 Wreck of the troopship *Birkenhead* with loss of 485 lives, 1-472.

- 27** 1807 Henry Wadsworth Longfellow, American poet, born, 5 34; United States Literature, 7 364.
 1881 Boers defeated British at Majuba Hill, South Africa. Boer War, 1-502; South Africa, 7 88; Transvaal, 7 308; United Kingdom, 7 351.
 1900 British defeated Boers at Paardeberg. Boer War, 1-502; Roberts, 6-414.

- 28** 1533 Michel de Montaigne, French essayist, born, 5 248; France: Literature, 3 455.
 1683 René de Réaumur, French inventor of a thermometer, born. Thermometer, 7 268.
 1865 Sir Wilfred Grenfell, British doctor and missionary, born, 4 96; Labrador, 4 427.
 1900 Relief of Ladysmith. Boer War, 1-502; Natal, 5-325.
 1922 British protectorate of Egypt ended. Egypt, 3-172.
 1948 The last British troops left India. British Commonwealth, 2 82; India: History, 4 251; United Kingdom, 7-347.

- 29** 1712 Marquis de Montcalm, French soldier, born, 5 219; Quebec, 6 320; Wolfe, James, 7 465.
 1792 Gioachino Antonio Rossini, Italian composer, born. Opera, 5 514, 516.



Feb. 24, 1500. Charles V (above), Holy Roman Emperor and King of Germany and Spain, is here depicted by Titian.



MARCH

Nature Notes Though winds of March are proverbially chill and night sometimes sketches frost patterns (3 477) on the window pane, increasing sunshine sets fields and woods aglow with the pulse and colour of new life. Gay nodding daffodils (3 25) golden dandelions (3 40) the gold and the silver catkins of palm-willow (7 151) young fronds of bracken fern (2 37) just beginning to uncurl and hawthorn-like flowers on leafless branches of the sloe or blackthorn (6 228) are lovely evidence of spring on the way. The ash trees (1 263) too are sporting small but profuse flowers. A very great occasion (to match the coming of the daffodils) is the arrival of the first swallows and martins and swifts (7-197). The greenfinch (3 352) sing. The blackbird (1 477) are laying brown speckled bluish-green eggs and majestic ravens (6 366) are already sitting. A gorgeous painted peacock butterfly (2 139) flits a trifle uncertainly through warming sun rays and a nestful of not so pleasant ants (1 169) sends out scouting parties to report on general conditions. The pet tortoise (7 211) tempted out perhaps unseasonally crawls sleepily from its winter quarters to search the garden for juicy seedlings. Harmless grass snake (4 65) and venomous adder or viper (7 102) emerging from where they have slept for months begin their gliding search for food—especially slow moving slugs (7 72) cautious frogs and similar fare.

1 St. David's Day. David or Dewi patron saint of Wales.
1711 First number of *The Spectator*. Addison and Steele's periodical, 1 15. English Literature 3-287. Steel, Sir Richard, 7 154.

1871 German army entered Paris. France. History 3 463. Franco-Prussian War 3 459. Germany. History, 4 8.

1896 Abyssinians defeated Italian army of invasion at Adowa. Abyssinia, 1 7.

1915 St. Dunstons, Regent's Park, opened as hostel for the blind. Blind, Education of the, 1 488.

2 1545 Thomas Bodley, founder of Bodleian Library, born. Library, 4 186. Oxford 6-200.

1825 Work started on Thames Tunnel. Brunel 2-99. Tunnels, 7 326. Thames, 7 263.

3 1792 Robert Adam, Scottish architect died 1 14. Architecture, 1 217. Furniture, 3 491.

1853 Vincent Van Gogh, Dutch painter, born, 7-381. Painting, 6 36. Post Impressionists, 6 2.

1875 Bizet's opera *Carmen* first played at Opéra Comique, Paris. Opera, 5 515, 516.

1918 Treaty of Brest Litovsk between Germany and Russia. Russia, 6-476. World Wars, 7-482.

1924 Turkey abolished Caliphate and disestablished Muslim religion. Kemal Atatürk, 4-397. Mahomet, 5 87. Turkey, 7-336.

4 1193 Saladin, Sultan of Egypt and Syria, died, 6-488. Crusades, 3 2. Damascus, 3-34. Egypt, 3-175. Jerusalem, 4 363.

1681 Pennsylvania granted by charter to William

Penn. 6 118. Pennsylvania 6 120. Quakers 6 317.

1824 Royal National Life Boat Institution founded. Lifeboat, 4 493.

1837 Chicago chartered as a city, 4-333.

1890 Forth Bridge opened. Bridge, 2 64.

1941 British raid on the Lofoten Islands. World Wars 7 190.

5 1397 Foundation stone of New College, Oxford laid. Oxford, 6 17.

1931 Civil disobedience in India ended. Gandhi 3 301. India. History 4 254.

1933 Last German free elections before Nazi regime. heavy Nazi gains. Germany. History, 4 10. Hitler 4 181. National Socialism, 5 328.

6 1806 Elizabeth Barrett Browning, English poet, born, 2 94.

1857 Indian Mutiny began. British Commonwealth, 2 84. India. History 4-252. United Kingdom, 7-350.

1888 Louisa M. Alcott, author of *Little Women* died 1 97. Children's Books, 2 356.

7 1792 Sir John Herschel. British physicist, died. Nebulae, 5 361.

1804 British and Foreign Bible Society founded. Bible, 1-440. Borrow, George 2 20.

1850 Thomas Masaryk, first President of Czechoslovakia, born, 5-143. Czechoslovakia 3 21. European History 3 316. World Wars, 7-485.

1936 German troops reoccupied the Rhineland. Germany. History, 4-10. Hitler, 4-183. World Wars, 7-485.

MARCH

1945 U.S. troops crossed the Rhine at Remagen. Rhine, 6-391; World Wars, 7-496.

8 1702 Death of William III. English History, 3-281; William, Kings of England, 7-452.
1918 Trotsky resigned post of foreign minister of Russia. Russia, 6-476

9 1566 David Rizzio, secretary to Mary Queen of Scots, murdered at Holyrood. Mary Stuart, 5-141; Scotland, 6-512.

1749 Mirabeau, French statesman and orator, born, 5-224. French Revolution, 3-468.

1762 William Cobbett, British writer and reformer, born 2-435.

1918 Russian capital moved from Petrograd to Moscow. Leningrad, 4-480. Moscow, 5-270.

10 1801 First census taken in Great Britain. Census, 2-291

1906 London's Bakerloo tube line opened. London, 5-28. Underground Railways, 7-345.

1948 Jan Masaryk, Czech statesman, found dead under window of his home, 5-143. Czechoslovakia, 3-21

11 1544 Iasso, Italian poet, born. Italy. Literature, 4-329.

1682 Chelsea Hospital, for old soldiers, founded. London, 5-27.

1876 First telephone call made by Alexander Graham Bell. 1-422. Telephone, 7-240



March 11, 1682 Two pensioners of Chelsea Hospital, London, which accommodates some 550 old and disabled soldiers

1917 British took Baghdad, 1-346; Iraq, 4-278; World Wars, 7-481.

1938 Germans invaded Austria, 1-324; European History, 3-318; Germany: History, 4-10; Hitler, 4-183; World Wars, 7-485 (picture), 480.

1941 U.S. Lease-Lend bill became law. Lease-Lend, 4-465; Roosevelt, F. D., 6-450; United States: History, 7-363

12 1507 Cesare Borgia, Italian tyrant, killed Borgia, 2-17.

1609 Bermudas became an English colony, 1-435. British Commonwealth, 2-85.

1838 Sir W. H. Perkin, founder of aniline dye industry, born. Coal-tar, 2-134; Dyes, 3-141.

1917 Outbreak of Russian Revolution. Communism, 2-475; Lenin, 4-478; Nicholas II, 5-431; Russia, 6-474.

1939 Coronation of Cardinal Eugenio Pacelli as Pope Pius XII. Pius, 6-210; Papacy, 6-60

13 1733 Joseph Priestley, English physicist, born. Chemistry, 2-317. Oxygen, 6-23. Rubber, 6-464

1781 Sir William Herschel discovered Uranus, 7-370. Planets, 6-213. Sun, 7-188.

1881 Assassination of Tsar Alexander II. Russia, 6-474; Slavery, 7-455.

14 1864 Albert Nyanza discovered and named by Sir Samuel Baker, 1-348. Africa, 1-54.

1879 Albert Einstein, German physicist, born, 3-205. Gravitation, 4-67. Relativity, 6-380.

1885 First production of Gilbert and Sullivan's comic opera *The Mikado* at the Savoy Theatre, London, 4-21. Opera, 5-515

15 44 B.C. Julius Caesar murdered, 2-163. Britain, 2-73. Cleopatra, 2-407. Latin Literature, 4-450. Rome. History, 6-433

1649 John Milton appointed secretary to Council of State, 5-210.

1841 Heads of houses at Oxford censured John Henry Newman's 'Tract 90,' 5-399

1877 First eleven a side cricket Test Match. Australia v. England, at Sydney. Cricket, 2-531.

1917 Nicholas II, last Tsar of Russia, abdicated, 5-432. European History, 3-317; Russia, 6-474.

World Wars, 7-481

1939 German occupation of Czechoslovakia, 3-24. Germany, 4-10; Hitler, 4-183; World Wars, 7-486.

16 1787 Georg Simon Ohm, German electrical pioneer, born. Electricity, 3-211

1891 Submarine telephone cable from London to Paris completed. Cable, 2-152

1923 German government ordered passive resistance to French occupation forces in Ruhr. Ruhr, 6-469; World Wars, 7-485.

1930 Death of Primo de Rivera, Spanish dictator, Spain, 7-109.

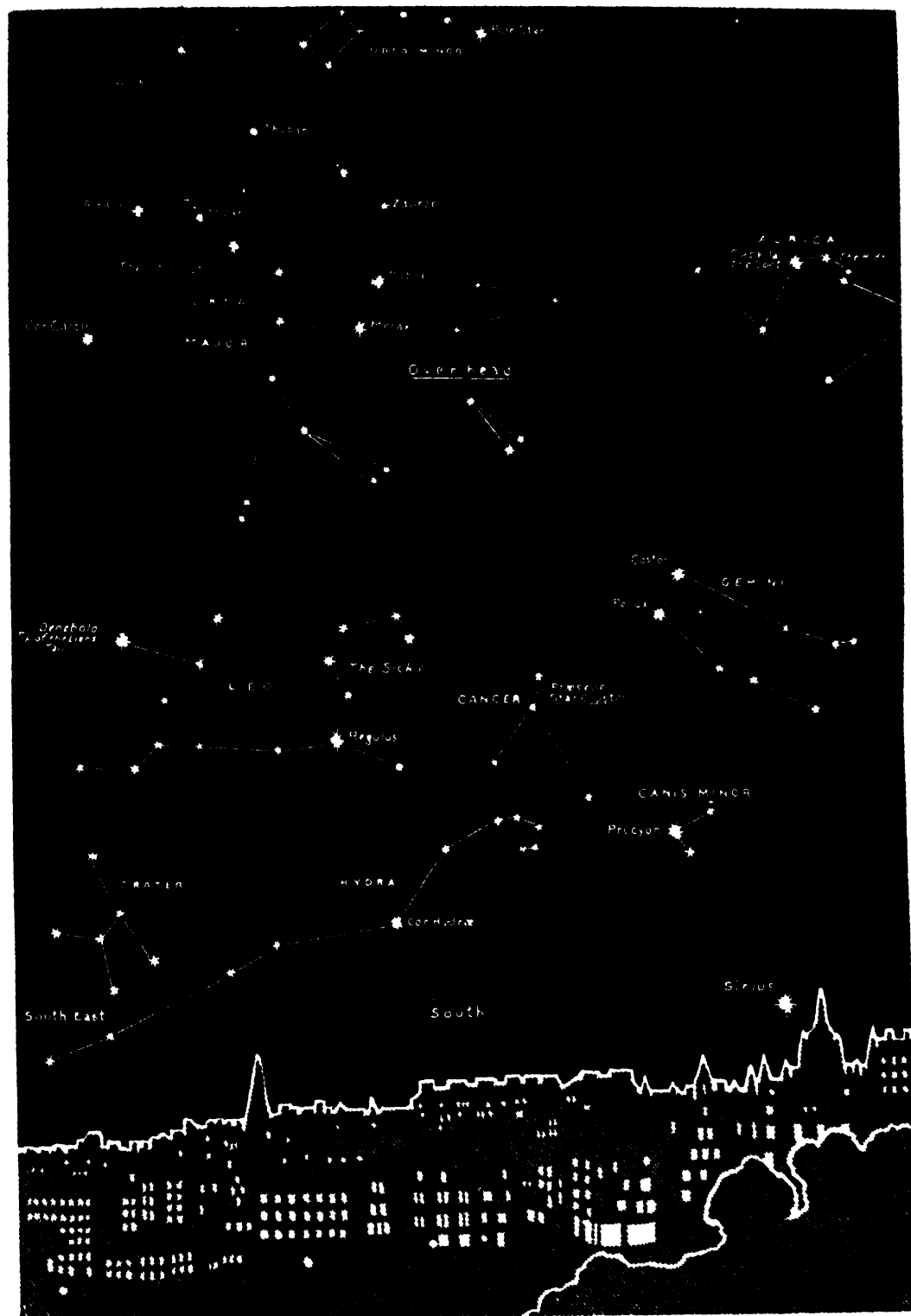
17 St. PATRICK'S DAY, 6-96. Ireland, 4-282.

180 Roman Emperor Marcus Aurelius died. Marcus Aurelius, 5-123. Rome, 6-439.

1337 Duchy of Cornwall founded. Cornwall, 2-508.

1948 50-year treaty of alliance signed at Brussels by Britain, France, and the Benelux countries. Belgium, 1-420; Luxemburg, 5-54.

MARCH.



THE STARS IN MARCH. With this map you can study the stars from the middle of March to the middle of April. You are looking south in Edinburgh. Many of the stars in last month's diagram will be seen in the west and south-west. Throw the head well back, or turn completely round, to see the stars beyond the point marked Overhead

MARCH



March 18, 1584 Death of Ivan IV of Russia (above), surnamed the Terrible. He was proclaimed Tsar at seventeen.



March 23 1312 Knight Hospitaller (above left) and Knight Templar or Knight of St. John (above right). The former wore a white cross; the latter a red.

18 978 Edward the Martyr assassinated. Edward, Kings of England, 3-166.
1584 Ivan the Terrible, Tsar of Russia, died, 4-331, Russia, 6-474.

1869 Neville Chamberlain, British statesman, born, 2-300, Munich, 5-296, United Kingdom, 7-352, World Wars, 7-446.

1871 Commune set up in Paris, France. History, 3-453, Franco-Prussian War, 3-459.

19 1821 Sir Richard Francis Burton, British traveller, born, 2-133, Arabia, 1-195.
1858 Relief of Lucknow, 5-49, India. History, 4-253.

1859 Gounod's opera *Faust* first performed. *Faust*, 3-343, Opera, 5-516.

1932 Sydney Bridge opened, 7-216, Bridge, 2-65 illus., 66.

20 1727 Sir Isaac Newton died, 5-408, Gravitation, 4-65, Light, 4-498, Physics, 6-186, Telescope, 7-248.

1851 Marble Arch, London, unveiled on present site. Buckingham Palace, 2-104, London, 5-26.

1945 Mandalay recaptured from the Japanese by the British. Burma, 2-130, World Wars, 7-496.

21 FIRST DAY OF SPRING. Month, 5-265, Seasons, 6-526.

1685 Johann Sebastian Bach, German composer, born, 1-339, Music, 5-305.

1801 Abercromby's victory over the French at Aboukir. Nelson, 5-363.

1918 Great German offensive opened against British Fifth Army. World Wars, 7-482.

22 1599 Sir Anthony Van Dyck, painter, born, 7-379, Netherlands. Art, 5-342.

1824 Purchase of 38 pictures from J. J. Angerstein's collection begun. British National Gallery Collecting, 2-454, National Gallery, 5-328.

23 1312 Order of Knights Templars banned in most European countries, 4-418. Crusades, 3-2.

1918 Paris first shelled by the German gun, Big Bertha, from 75 miles' distance. Paris, 6-950.

1935 USSR sold Chinese Eastern Railway to puppet state of Manchukuo. Manchuria, 5-112.



March 20 1727 This house, formerly standing in St. Martin's Street, London, was the home of Sir Isaac Newton.

MARCH

24 809 Caliph Haroun Al Raschid died
Arabian Nights, 1 196 Baghdad, 1 346
Jerusalem, 4 363 •

1490 Georg Agricola, German mineralogist, born
Mines and Mining 5 216

1607 Michael Adriaenszoon de Ruyter Dutch sailor
born Blake, Robert, 1 492

1834 William Morris, English poet and artist born,
5 266 Embroidery facing 3 237 (colour plate)
Furniture 3 494

25 FEAST OF THE ANNUNCIATION LADY DAY
Madonna 5 66

1807 Slave trade abolished by British
Parliament Africa 1 54 Cameroons 2 190
Hawkins 4 141, Slavery 7 65

1821 Greece revolted against the Ottoman Empire
anniversary kept as Greek Independence Day 4 78
European History 3 315 Turkey 7 335

1924 Greece became a republic 4 78

26 1753 Benjamin Thompson Count Rumford
American soldier and physicist born
Energy 3 245 Heat 4 145

1827 Beethoven German composer died 1 411
Music 5 305 Piano 6 195

1918 Allies, by the Doullens Agreement, decided to
appoint Marshal Foch Allied commander in chief
Foch 3 404 World Wars, 7 482

27 1766 Goldsmiths *Year of Wakeful* pub-
lished 4 42 English Literature 3 288
Johnson Samuel 4 380

1802 Treaty of Amiens Between Britain and France
United Amiens 1 139 Napoleon 1 5 319
United Kingdom 7 348

To celebrate this Boulton Watt and Co's engine
works at Soho Birmingham was the first building
to be lit by gas Gas 3 505 Murdoch William
5 296



March 26 1827 Beethoven's pianoforte (above) on which
he composed a number of his later works



March 31 1836 The Leather Bottle at Cobham Kent was
immortalised by Dickens in *The Pickwick Papers*

28 1483 Raphael born (or April 6) 6 363
Italy Art, 4 320 Madonna 5 69
Painting 6 34 Renaissance 6 386

1660 George I born 3 521 Anne 1 159 Jacobites
4 344 United Kingdom 7 247

1749 Pierre Simon Laplace French astronomer born
Planets 6 213

1941 British naval victory over Italians at Cape
Matapan World Wars 7 490

29 1869 Sir Edwin Lutyens British architect
born Delhi 3 68 Liverpool 4 526

1939 End of the Civil War in Spain Franco
3 457 Madrid 5 72 Spain 7 111

1945 Last flying bomb of the Second World War fell
in England Flying Bomb 3 404 World Wars
7 495 496 (picture)

30 1282 Sicilian Vespers (massacre of
Frenchemen in Sicily) Italy 4 313 Sicily
7 30

1856 Peace of Paris signed ending Crimean War
Crimea 2 532 Russia 6 474 United Kingdom
7 350

31 1596 Rene Desartes French philosopher
born 3 77 Philosophy 6 160

1732 Joseph Haydn Austrian composer
born* 4 142 Music 5 305

1811 Robert Wilhelm Bunsen German chemist
born 2 124

1836 First monthly number of Dickens's *Pickwick
Papers* published 3 86



APRIL

Nature Notes Waves of blossom sweep the countryside refreshed by April showers. Most trees have clothed themselves with new leaves (4-409), refreshing greenery acting as foil for pinkish apple blossom (1-185), snowy white pear (6-100), plum (6-288), and cherry (2-327). The tremendous "candles" of horse-chestnut (4-197) are alight. Primroses (6-287) clothe the hedgerbanks, bluebells (1-494) and wood anemones (1-150) the woodland open spaces. The returning cuckoo (3-7) is heard, and the nightingale (5-430) sings. Parent birds are busy finding food for fledglings. Evidence of foraging success is often shown in the thrush's "breakfast table" (1-153), a large stone on which the bird hammers to pieces the shell of a victim snail (7-73). White butterflies (2-139) are unwelcome in the vegetable garden, for there, on cabbage plants, they will soon be laying eggs. The superb dragonfly (3-112), a veritable "flash of light," swoops at winged prey above the pond in which its larvae will presently be devouring most things encountered, including even tough water-beetles (1-415), and newts (5-407) which are now making their way to the ponds to breed. And the fox's "earth" sees a great deal of coming and going, for now the cubs are born (3-126).

1 ALL FOOLS' DAY, 1-186.

- 1578 William Harvey, discoverer of the circulation of the blood, born, 4-135. Anatomy, 1-143; Blood, 1-492; Medicine, 5-162.
1815 Otto von Bismarck, German statesman, born, 1-174; European History, 3-316; Franco-Prussian War, 3-458; Germany: History, 4-8.
1918 Royal Air Force formed, 6-460. Aeroplane, 1-41, 42.
1945 U.S. forces landed on Okinawa, Japan, 4-350; Pacific Ocean, 6-32; World Wars, 7-498.
1947 Nationalisation of electricity supply in U.K. came into force. Electric Light and Power, 3-220; Labour Party, 4-427; United Kingdom, 7-354.
1949 Newfoundland became the tenth province of Canada, 5-399; Canada, 2-200.

- 2 1801 Nelson's victory at Copenhagen. Copenhagen, 2-501; Nelson, 5-363.
1805 Hans Christian Andersen, Danish author, born, 1-144.
1827 Holman Hunt, English painter, born. English Art, 3-262; Jesus (Christ, 4-367 (picture); Pre-Raphaelites, 6-284.

- 3 1682 Spanish painter, Murillo, died, 5-297; Spain: Art, 7-121.
1783 Washington Irving, American author, born, 4-296; United States: Literature, 7-364.
1933 First flight over Mount Everest, 3-320; Asia, 1-264; Himalayas, 4-176.

- 4 1648 Grinling Gibbons, English sculptor and wood-carver, born, 4-19; Furniture, 3-491.
1687 James II ordered his Declaration of Indulgence to be read in churches. James, Kings of England, 4-339.

1933 U.S. dirigible *Akron* lost. Airship, 1-84-85.

1949 Signing of the North Atlantic Treaty by twelve nations. North Atlantic Treaty Organization, 5-157, European History, 3-319.

- 5 1794 Danton, French revolutionist, guillotined, 3-47; French Revolution, 3-469.
1827 Lord Lister, British surgeon, born, 4-522. Antiseptics, 1-176; Medicine, 5-165; Pasteur, 6-95.
1837 Algernon Charles Swinburne, English poet, born 7-210; English Literature, 3-291.

- 6 1528 Albrecht Durer, German engraver, died 3-139; Engraving, 3-293; Germany, 4-3. Nuremberg, 5-476. Painting, 6-34.
1850 Koh-i-Noor, famous diamond, left India to become property of British Crown. Crown Jewels, 2-536; Diamond, 3-84.
1909 Robert E. Peary reached the North Pole, 6-103; Polar Exploration, 6-244.
1917 U.S.A. declared war on Germany. United States: History, 7-363; World Wars, 7-491.
1941 Germany invaded Yugoslavia and Greece. Greece, 4-79; World Wars, 7-490 Yugoslavia, 7-520.

- 7 1614 El Greco, Greek painter of Spanish school, died, 4-70; Spain: Art, 7-112.
1770 William Wordsworth, English poet, born, 7-476; Coleridge, S. T., 2-448; English Literature, 3-288; Lake District, 4-439.
1795 The metre made the official measuring unit of length in France. Metric System, 5-184.
1911 Count Zeppelin made a flight with passengers in his airship from Friedrichshafen to Stuttgart. Airship, 1-83.
1939 Italy invaded Albania, 1-02; Mussolini, 5-311; World Wars, 7-486.

APRIL

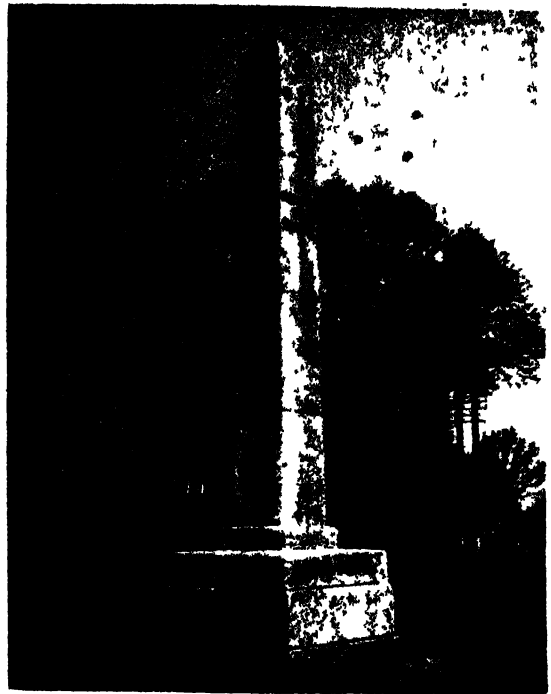
8 1492 Lorenzo de Medici, Florentine prince, died. Italy: History, 4 313, Medici, 5 160
1904 Anglo-French *entente* concluded. Edward, Kings of England, 3 169; United Kingdom, 7-351.
1943 Eighth Army and U.S. forces met in Tunisia, 7 325, Libya, 4 490; Montgomery, 5-253, World Wars, 7 493.

9 1838 National Gallery, London, opened, 5 327, Italy: Art, 4-319, 320, London, 5-23, Netherlands Art, 5 381, 383, 390, 392
1869 Hudson's Bay Company agreed to cede their territorial rights to Canada, 4 200, Canada, 2 200.
1924 General C. G. Dawes produced his plan for German reparations World Wars, 7 483
1940 Germany invaded Denmark and Norway Denmark, 3-75; European History, 3 318, Norway, 5 466, World Wars, 7 487

10 1739 Dick Turpin hanged at York. Highwaymen, 4 176
1778 William Hazlitt, English critic and essayist, born English Literature, 3 290.
1829 General William Booth, founder of Salvation Army, born, 2 13, Salvation Army, 6 493.
1829 Catholic Emancipation Bill passed by Parliament O'Connell, 5 499, Roman Catholic Church, 6 426, United Kingdom, 7 349; Vote, 7 407
1848 Chartists' meeting on Kennington Common United Kingdom, 7 319 (picture).
1860 George Eliot's novel *The Mill on the Floss* appeared, 3 229 English Lit., 3 291, Novel, 5 472

11 1713 Treaty of Utrecht, 7 372, Gibraltar ceded to Britain, 4 20
1861 Civil War opened in America Lee, 4 411, Lincoln, Abraham, 4 511, United States History, 7 362

12 1928 First successful east to west flight across Atlantic began. Aeroplane, 1 42.
1934 Wind-speed of 231 m.p.h. recorded at Mount Washington University, U.S.A. Wind, 7 459.
1945 Death of F. D. Roosevelt, U.S. President, 6-449; Truman, 7-321, United States History, 7-363



April 14, 1471 Hadley High Stone, Hertfordshire (above), near London, marks the site of the Battle of Barnet

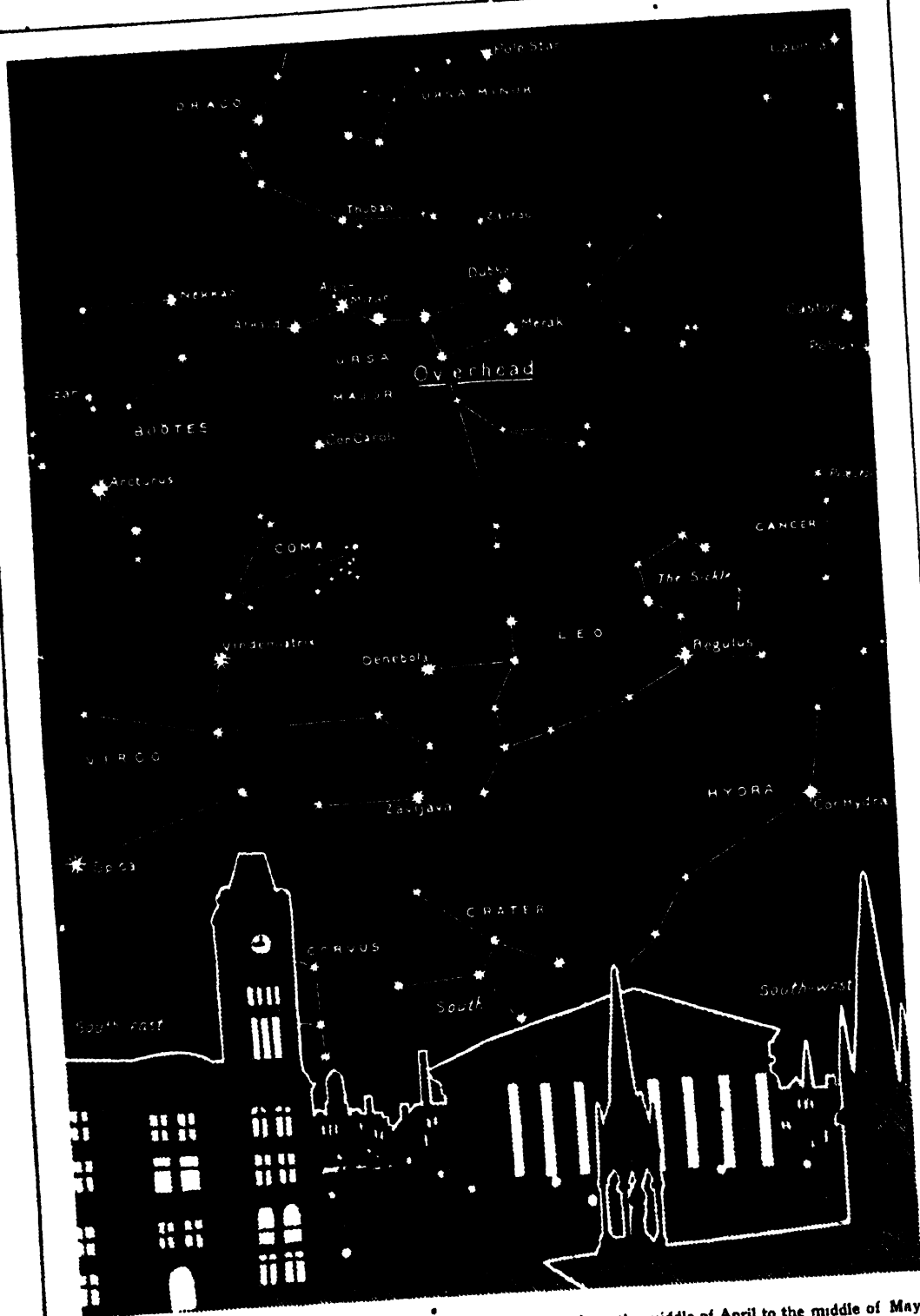
13 1742 Handel's *Messiah* first performed. 4-126, Music, 5 305, Musical Instruments, 5 307
1771 Richard Trevithick, builder of first moving steam carriage, born, 7 316, Locomotive, 5 1.
1912 Royal Flying Corps constituted by royal warrant. Royal Air Force, 6 460

14 1471 Battle of Barnet. Edward IV, 3 167
Roses, Wars of the, 6 454.
1629 Christiaan Huygens, Dutch astronomer, born. Light, 4 500, Pendulum, 6-115.



April 9, 1940 The Germans invaded Norway without a declaration of war, and remained in occupation there for five years. A puppet government, under Quisling, was set up Here Nazi troops are seen on guard in Oslo, Norway's capital

APRIL



THE STARS IN APRIL. With this map you can study the stars from the middle of April to the middle of May. You are looking south in Chamberlain Square, Birmingham. The Great Bear, Ursa Major, is prominent overhead.

APRIL

1865 Abraham Lincoln, U.S. President, shot in theatre by John Wilkes Booth, 4-511.
1931 Spain became a republic, 7-110; Alfonso XIII, 1-102.

15 **1755** Dr. Samuel Johnson published his Dictionary, 4-379; Dictionary, 3-88; English Literature, 3-288.

1888 Matthew Arnold died, 1-254; English Literature, 3-291; Poetry, 6-235.

1912 White Star liner *Titanic* sunk by hitting iceberg, Icebergs, 4-229, 230.

1923 Insulin discovered by Sir F. G. Banting, Gland, 4-28; Medicine, 5-163, 165.

16 **1746** Battle of Culloden. Jacobites, 4-331, 335; Scotland, 6-512.

1889 Charles Chaplin born, 2-303. Cinema, 2-396, 399.

1942 Malta awarded the George Cross, 5-98, 99. Orders and Decorations, 5-530.

17 **1492** Ferdinand and Isabella signed their grant to Columbus, 4-301; America: Discovery, 1-132; Columbus, 2-467.

1837 J. Pierpont Morgan, American business man and collector, born. Collecting, 2-454.

1897 Thornton Wilder, American novelist, born. United States: Literature, 7-366.

1940 Yugoslavia capitulated to Germans, 7-520; World Wars, 7-490.

18 **1587** John Foxe, author of the *Book of Martyrs*, died. Martyrs, 5-139.

1881 Natural History Museum, South Kensington, opened. London, 5-27; Museum, 5-300.

1906 Great earthquake at San Francisco, 6-497; Earthquakes, 3-153.

1946 International Court of Justice opened. The Hague, 4-116; Law, 4-459; United Nations, 7-354.

19 **1775** Battle of Lexington, opening of War of American Independence, 1-137; United States: History, 7-361.

1839 Belgium became an independent kingdom, 1-417; European History, 3-315.

1881 Benjamin Disraeli, Earl of Beaconsfield, died, 2-93; the anniversary celebrated as *Primrose Day*. Conservatives, 2-487; Peel, Sir Robert, 6-105; United Kingdom, 7-350; Victoria, Queen, 7-396.

20 **1657** Admiral Blake defeated the Spanish fleet off the Canary Islands, 1-482.

1689 Opening of the siege of Londonderry, 5-34; Ireland, 4-282; James, Kings of Great Britain, 4-359; William III, 7-452.

1808 Napoleon III, Emperor of the French, born, 5-323; France: History, 3-453; Franco-Prussian War, 3-458.

1891 Ibsen's *Hedda Gabler* first produced in England, at Vaudeville Theatre, London. Drama, 3-122; Ibsen, 4-227.

1947 Christian X, King of Denmark, died. Denmark, 3-75.

21 **1782** Friedrich Wilhelm August Froebel, German educationist, born, 3-471. Education, 3-166.

1816 Charlotte Brontë, English novelist, born, 2-91; English Literature, 3-291; Novel, 5-471, 472.

1873 Canadian North-West Mounted Police established. Canada, 2-201; Police, 6-253.

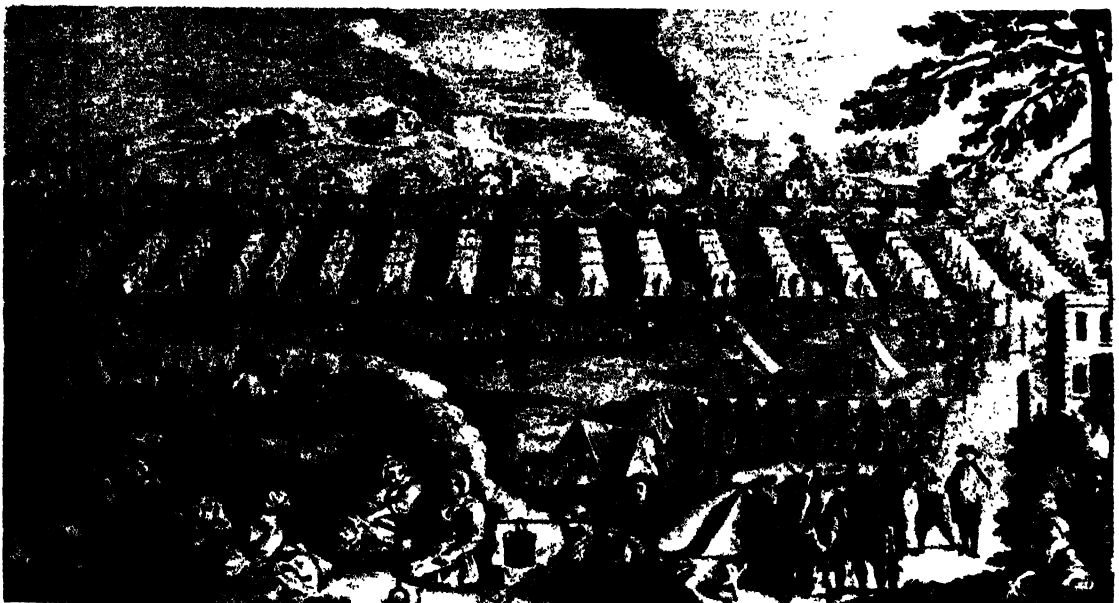
1920 Galsworthy's play *The Skin Game* first performed in London, 3-500.

1926 Queen Elizabeth II born, 3-233.

22 **1707** Henry Fielding, English novelist, born, 3-349; English Literature, 3-288; Novel, 5-471; Police, 6-247.

1724 Immanuel Kant, German philosopher, born, 4-393; Philosophy, 6-160.

1857 First Parliament in S. Australia opened, 1-318.



April 16, 1746 At the battle of Culloden the Jacobite rebels were finally defeated by the English forces. Picture Post Library

APRIL

23 **ST. GEORGE'S DAY**, 3 520.
1616 William Shakespeare died, 7-12,
 Drama, 3-118, 119, English Literature,
 3-285, Poetry, 6-234, 235, Stratford 7-171.

1662 Connecticut chartered as a British colony
 United States. History, 7 361.

1858 Max Planck, German physicist, born Quantum
 Theory, 6-318.

1924 British Empire Exhibition, Wembley, opened.
 Exhibitions, 3-328

24 **1743** Edmund Cartwright, inventor of power
 loom, born, 2 255, Loom, 5 36, Weaving,
 7-431

1815 Anthony Trollope, English novelist, born,
 7 318, English Literature, 3-291, Novel, 5 472

1916 Outbreak of Easter Rebellion in Dublin
 Dublin, 3 130, Ireland, 4 283

25 **1792** John Keble, English poet and divine,
 born Hymns, 4 226 Oxford, 6 15

1915 Landing of Australian and New
 Zealand Army Corps at Gallipoli (ANZAC DAY)
 Dardanelles, 3-49, World Wars, 7 480

1945 San Francisco Conference of the Allied nations
 opened, 6-497, United Nations, 7 354

26 **1594** Globe Theatre, Bankside, south of the
 Thames, London, opened Shakespeare,
 7-13, Theatre, 7-265

1711 David Hume, Scottish philosopher, born
 Philosophy, 6 160.

1769 First Royal Academy exhibition opened
 Academy, 1 9, English Art, 3-258, 259, Painting,
 6 36

1925 Hindenburg elected German President (Ger-
 many: History, 4-10; World Wars, 7-479, 482

27 **1737** Edward Gibbon, English historian
 born, 4-19; History, 4 181.

1791 S. F. B. Morse, inventor of electric
 telegraph, born, 5 287, Telegraphy, 7 237, 238

1818 Order of St Michael and St. George founded.
 Knighthood, 4-418, Orders and Decorations, 5-330.

1828 London Zoological Gardens opened. London,
 5-27, Zoological Gardens, 7 525

1941 Germans occupied Athens, 1 288, Greece,
 4-79; World Wars, 7-490

28 **1220** Foundation stone of Salisbury (Cathedral
 laid, 6 489 Architecture, 1 211,
 Cathedral, 2 265

1442 Edward IV, King of England, born, 3 167,
 Roses, Wars of the, 6 454

1801 Anthony Ashley Cooper, 7th Earl of Shaftes-
 bury, English reformer, born, 7 11, London,
 5-29.

1945 Benito Mussolini, Italian dictator shot by
 partisans, 5 310, Fascism, 3 341 Italy, 4 316,
 Munich, 5-296, World Wars, 7 484, 485

29 **1783** David Cox, English landscape painter,
 born English Art, 3 262

1879 Sir Thomas Beecham, British musical
 conductor, born Opera, 5 516

1884 Statute passed at Oxford University admitting
 women to examinations Oxford, 6-17

1945 Germans in Italy surrendered unconditionally
 Alexander 1 100, World Wars, 7 496

30 **1789** George Washington inaugurated as
 first President of USA, 7 420, American
 Independence 1 138 United States
 History, 7 361.

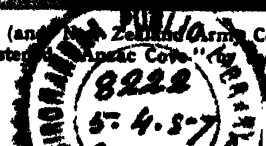
1803 President Jefferson purchased Louisiana from
 France Jefferson, 4 358 Louisiana, 5-45 United
 States. History, 7 361

1827 Foundation stone of London University laid
 5-33, Universities, 7 368

1834 Sir John Lubbock (Lord Avebury), British
 writer and entomologist, born, 1 329, Holidays
 4 187



April 25, 1915. From the initial letters of the words Australian (and New Zealand Army Corps, this cove lying to the north of Gaba Tepe, on the Gallipoli peninsula, Turkey, was christened "ANZAC Cove" by the troops who landed there





MAY

Nature Notes Fragrance of hawthorn (4-142), more often called "may," and of elder (3-207) and of lilac (4-508) in the garden, is associated with this month. Beech trees (1-407), and holly (4-187), and oak (5-480) produce their flowers—much less noticeable than will be the later beech nuts or 'mast,' and red berries, and smooth, plump acorns. Fragile blossom of water-crowfoot (7-420) stands a little way above the surface of the pond. Eerie hoots and startling screams of owls (6-11) a-wing in late evening precede the night-long hunt for mice (5-288). Another strange call comes from that other bird of the dusk, the nightjar (5-438). Glow-worms (4-30) shine before the stars are out. In sunshine, small blue butterflies (2-140), and the small copper butterfly (2-130), zigzag like scraps of coloured paper. Wasps (7-424), in intervals of pouncing upon and eating flies, are founding new colonies. That giant among insects, the stag-beetle (1-415), wears such a forbidding aspect that most other creatures leave it alone. Lizards (4-530) bask in the sun, or dart away, as nimble and noiseless in movement as the aquatic water-rat or water-vole (6-365), and as the sleek sticklebacks (7-157) ready to defend their nests of waterweed against all comers. Above the water, mayflies (5-150) live out their few hours of winged flight. As day draws to its close, the badger (1-345) cautiously leaves its burrow to search out its supper of field mice or other small creatures.

1 MAY DAY; also kept as Labour Day. Month, 5-255; Odin, 5-500.

1707 Act of Union between England and Scotland. Anne, Queen, 1-159; English History, 3-281; Scotland, 6-513.

1851 Queen Victoria opened the Great Exhibition. Albert, Prince Consort, 1-93; Exhibitions, 3-327.

1931 Auguste Picard, Swiss scientist, made the first balloon ascent into the stratosphere. Air, 1-79; Balloon, 1-355; Stratosphere, 7-172.

1940 Gas industry in U.K. passed into state ownership, 3-507; Labour Party, 4-427; Socialism, 7-81.

2 1611 Authorized Version of the Bible published, 1-433; James, Kings of Great Britain, 4-339; Tyndale, 7-339.

1670 Hudson's Bay Company chartered, 4-200; Canada, 2-200; Furs, 3-496.

1729 Catherine II (the Great), Empress of Russia, born. Odessa, 5-500; Russia. History, 6-474.

1885 Leopold II of the Belgians proclaimed king of the Congo state, 2-481; Leopold, Belgian Kings, 4-481.

1945 Berlin captured by the Red Army. 1-432. Hitler, 4-181; World Wars, 7-496.

3 1469 Niccolò Machiavelli, Italian diplomatist and writer, born, 5-63. Italy: Literature, 4-330; Renaissance, 6-387.

1791 Poland's first liberal constitution accepted by the Diet: anniversary kept as Poland's National Day, 6-240.

1844 Richard D'Oyly Carte, producer of Gilbert and Sullivan operas, born, 4-20; Opera, 5-516.

1926 British General Strike began. Trade Union, 7-304; United Kingdom, 7-352.

4 1471 Battle of Tewkesbury. Henry, Kings of England, 4-163; Roses, Wars of, 6-454.

1769 Sir Thomas Lawrence, English painter, born. English Art, 3-260; Moore, Sir John, 5-259.

1825 Thomas H. Huxley, English biologist, born, 4-211; Darwin, 3-52.

1895 First issue of the *Daily Mail*, first halfpenny morning newspaper. Newspapers, 5-406; Northcliffe, 5-44.

5 1818 Karl Marx born at Trier, 5-139; Communism, 2-474; Socialism, 7-81.

1882 Cutting of Corinth Canal, Greece, begun. Canal, 2-207.

1930 Amy Johnson began solo flight to Australia (which took 20 days). Aeroplane, 1-44.

6 1856 Sigmund Freud, Austrian psychiatrist, born, 3-469; Brain, 2-42; Jung, 4-386; Medicine, 5-165; Memory, 5-168; Novel, 5-473; Psychiatry, 6-300.

1882 Phoenix Park murders in Dublin, Ireland. Parnell, 6-91.

1910 Death of Edward VII and accession of George V, 3-169; 3-522; United Kingdom, 7-351.

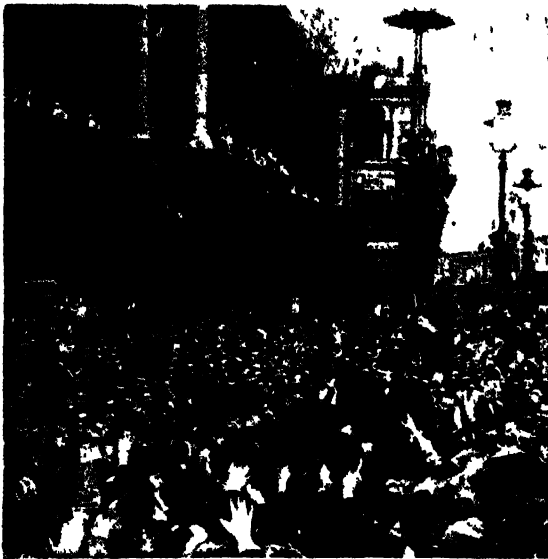
1937 Airship *Hindenburg* destroyed over Lakehurst, New Jersey. Airship, 1-84; Hydrogen, 4-221.

7 1765 Nelson's flagship, H.M.S. *Victory*, launched. Nelson, 5-364; Portsmouth, 6-266; Trafalgar, 7-305.

1812 Robert Browning, English poet, born, 2-95; English Literature, 3-290.

1833 Johannes Brahms, German composer and pianist, born, 2-39; Music, 5-303.

MAY



May 8, 1945. Part of the enormous crowd in Whitehall, London (above), acclaiming (Sir) Winston Churchill on VE-Day

- 1840** Piotr Ilyitch Tchaikovsky, Russian composer, born, 7-231. Music, 5 306.
1915 Liner *Lusitania* torpedoed. World Wars, 7-482.
1945 Unconditional surrender of all German forces. Germany: History, 4-11; World Wars, 7-496.

- 8** **1794** Lavoisier, French chemist, guillotined by Revolutionaries, 4 457. Chemistry, 2 317.
1844 Atlantic cable company organized. Cable, 2 153.
1945 VE-DAY: public holiday to celebrate surrender of Germany in the Second World War. European History, 3-319; Germany: History, 4 11. World Wars, 7-496

- 9** **1671** Attempt by Thomas Blood to steal the Crown Jewels, 1 494; Crown Jewels, 2 536 Vol. 2 frontispiece.
1926 First flight over the North Pole, by Byrd and Bennett. Aeroplane, 1 42; Byrd, 1 147.
1946 Victor Emmanuel III, King of Italy, abdicated Italy, 4 317.

- 10** **1655** English captured Jamaica, 4 338.
1857 Outbreak of Indian Mutiny. British Commonwealth, 2 84. India. History, 4 252; Lucknow, 5 49.
1940 Germany invaded the Low Countries. Belgium, 1 418; Luxemburg, 5 54; Netherlands, 5 380. World Wars, 7-487.
1940 Winston Churchill began his first premiership, 2-386; United Kingdom, 7 352.
1941 Heaviest air raid on London. House of Commons destroyed. British Museum, 2-90; London, 5 28. Parliament, 6-89.

- 11** **330** Constantinople dedicated as new Roman capital. Constantine, 2-488; Byzantine Empire, 2-148; Istanbul, 4 303.
1740 Maria Theresa crowned at Prague, 5 425; Austria-Hungary, 1 326; Germany: History, 4 8. Seven Years' War, 7 2.
1854 Ottmar Mergenthaler, inventor of the "Linotype" machine, born. "Linotype," 4-516.

- 12** **1588** Spanish Armada sailed from the Tagus. Armada, 1-240; Drake, Sir F., 3-113. English History, 3 277; Navy, 5-354.
1641 Strafford executed, 7-175; Charles, British Kings, 2 306; Laud, 4 453.
1812 Edward Lear, British humorous writer, born. Children's Books, 2 356. Limericks, 4 509.
1935 Death of Polish statesman Pilsudski. Poland, 6 240.
1943 German surrender in Tunisia complete, 7 325. Eisenhower, 3 206; World Wars, 7 493.
1944 Russians cleared last Germans from Crimea, 2 532.

- 13** **1792** Pope Pius IX born. Italy. History, 4 316; Papacy, 6-61; Pius, 6 210.
1835 John Nash, English architect, died, 5 321. Architecture, 1 217.

- 14** **1686** Gabriel Daniel Fahrenheit, German scientist, born. Heat, 4 148. Thermometer, 7 267.

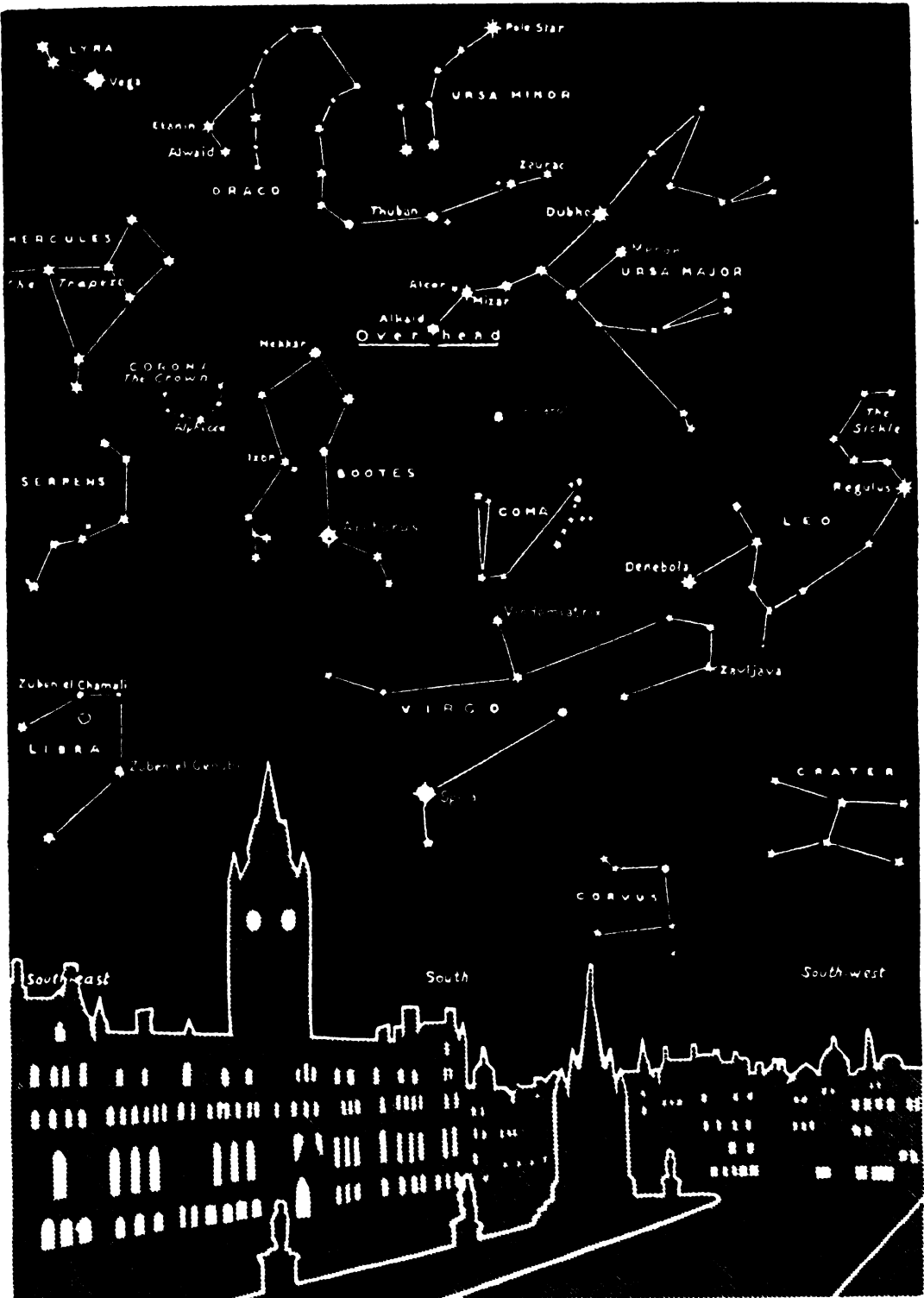
- 1796** Jenner's first public inoculation with vaccine, 4 360; Vaccination, 7 373.
1908 Franco British Exhibition opened in London (White City). Exhibitions, 3 327.
1932 Last B.B.C. broadcast from studios at Savoy Hill, London. Radio, 6 346
1940 Germans broke French line at Sedan. World Wars, 7-487.

- 15** **1679** Ashmolean Museum Oxford, founded Oxford, 6 20
1773 Prince Metternich, Austrian statesman, born. Austria-Hungary, 1 326.
1859 Pierre Curie, co-discoverer of radium, born. Curie, 3 11; Radio activity, 6 351; Radium, 6 352.
1942 British evacuated Burma, 2 130. Japan, 4 350. World Wars, 7 491



May 10, 1941. The Chamber of the House of Commons (above) after the heavy German air raid of that night

MAY



THE STARS IN MAY With this map you can study the stars from the middle of May to the middle of June. You are looking south in Albert Square, Manchester, with the Town Hall rising to the left. The constellation Draco, "The Dragon," lies high above your head, with its tail extending between the Pointers and the Pole Star.

MAY



May 16, 1811. During the Peninsular War, British, Portuguese, and Spaniards defeated the French at Albuera

16 1782 John Sell Cotman, English painter, born, 2-515; English Art, 3, facing 261 (colour plate), 262; Norwich, 5-467.

1811 French defeated by Allies at Albuera. Peninsular War, 6-116.

17 1673 Jacques Marquette set out to explore the Mississippi. America: Discovery, 1-136.
1881 Revised Version of New Testament issued. Bible, 1-443.

1900 Mafeking relieved. Boer War, 1-502.

1926 Chiang Kai-shek made supreme war lord in Canton, 2-333; China, 2-375.

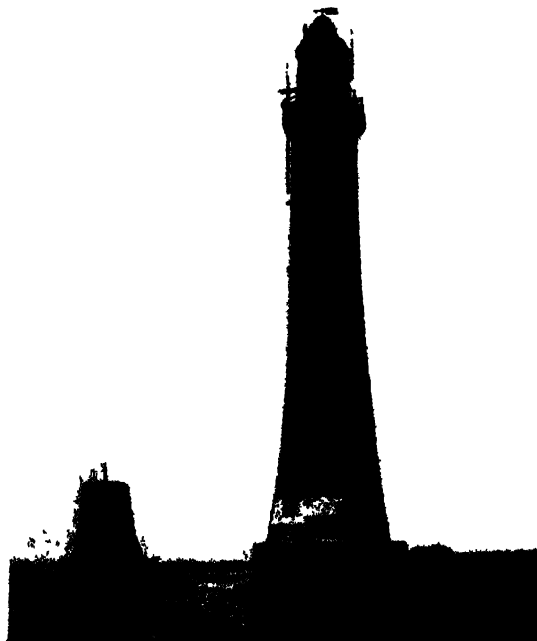
18 1843 Secession of Free Church from Established Church of Scotland. Free Churches 3-464.

1857 British Museum Reading Room opened, 2 88 Library 4-187.

1882 Present Eddystone Lighthouse opened, 4-502.

1890 Mascagni's opera *Cavalleria Rusticana* first played at Teatro Costanzi, Rome. Opera, 5-516.

1921 First Mount Everest reconnaissance party, led by Col. Howard Bury, started. Everest, 3-321



May 18, 1882. The fourth Eddystone Lighthouse opened. The stump of the third lighthouse can be seen on the left.

19 1536 Anne Boleyn, Queen of England, beheaded. Boleyn, 1-508; Henry, Kings of England, 4-164.

1802 Legion of Honour founded by Napoleon I. Legion, 4-476; Orders and Decorations, 5-530.

1906 Simplon Tunnel opened. Switzerland, 7 215; Tunnels, 7-326.

1914 Welsh Church Disestablishment bill passed by Commons. Wales, 7 413.

1935 T. E. Lawrence died after motor-cycling accident, 4-482.

20 1501 Ascension Island discovered. Atlantic Ocean, 1-292.

1780 Elizabeth Fry, English Quakeress and reformer, born, 3-480. Prisons, 6-291.

1799 Honoré de Balzac, French novelist, born, 1 358. France: Literature, 3-456; Novel, 5 472.



May 23, 1931. A pair of zebras grazing amid natural surroundings at Whipsnade Zoo, which was opened on this day.

1923 Stanley Baldwin first became British premier United Kingdom, 7 352.

1927 Charles A. Lindbergh started first solo Atlantic flight, New York to Paris, 4-513; Aeroplane, 1-42.

21 1618 Opening of Thirty Years' War, 7 269. Europe, 3 314; Germany: History, 7 269, Sweden, 7 204.

1892 Leoncavallo's opera *I Pagliacci* first played at Teatro del Verme, Milan. Opera, 5 519.

1894 Manchester Ship Canal opened. Canal, 2 207, Manchester, 5 111.

1916 Summer Time Act first came into force. Day light Saving, 3-55

22 1455 First Battle of St. Albans. Henry, Kings of England, 4 163; Rose, Wars of the, 6-453; St. Albans, 6 486.

1836 Mendelssohn's oratorio *St. Paul* produced at Düsseldorf, 5-170.

1856 Opening of the first Parliament of New South Wales, 5-402; Australia, 1-318.

1882 New bell, "Great Paul," for St. Paul's Cathedral, arrived in London. Bells, 1-427.

23 1701 William Kidd, pirate, executed, 4-402; Pirates, 6-206.

1707 Carl Linné or Linnaeus, Swedish botanist, born, 4-514. Biology, 1 452; Botany, 2-24.

1915 Italy declared war on Austria. Italy, 4 316. World Wars, 7-480.

1931 Whipsnade Zoological Park opened. Zoological Gardens, 7-525.

MAY



May 28, 1932 Work progress on the great dyke which now cuts off the former Zuider Zee from the North Sea

- 24** EMPIRE DAY (founded 1904) British Commonwealth, 2 82
 1738 John Wesley had a religious experience which led to the founding of Methodism, 7 439.
 Free Churches, 3 461
 1862 Westminster Bridge opened London, 5 24, 25.
 Thames, 7 263
 1870 Jan Christiaan Smuts, South African statesman, born, 7 72 Boer War, 1 502, South Africa, 7 92

- 25** 1659 Richard Cromwell resigned the Protectorate Cromwell, 2-534, English History, 3 290
 1810 The people of Buenos Aires deposed the Spanish viceroy, anniversary kept as Argentina's Independence Day 2 109, Argentina, 1 226, South America, 7 98
 1871 Bank Holidays Act passed Avebury, Lord, 1 329, Holidays, 4-167
 1871 Lloyd's (insurance society) received a royal charter 4 533
 1946 Transjordan (now Jordan) became an independent state Arabia, 1-193, Jordan, 4 382, Palestine, 6 45

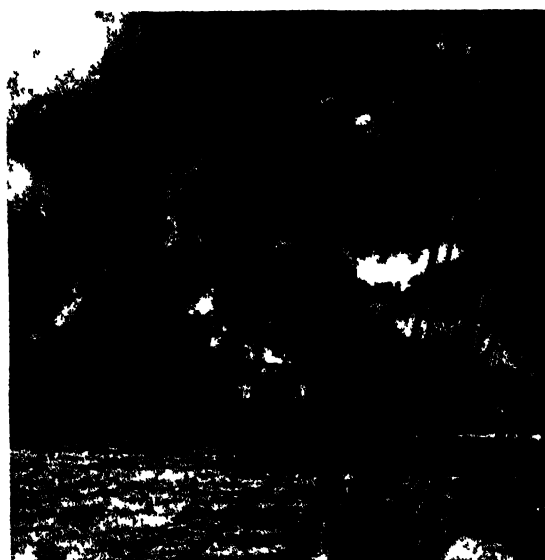
- 26** 735 The Venerable Bede, English historian and translator of the Scriptures, died Bible, 1 442
 1867 Queen Mary, Consort of George V, born, 1 140 Edward VIII, 3-169; George V, 3 522, George VI, 3 522

- 27** 1703 St Petersburg founded by Peter the Great Leningrad, 4 179, Peter the Great, 6-146, Russia, 6-474
 1865 American Civil War ended Lincoln, Abraham, 4-512, United States History, 7 362.
 1874 Henry Farman, French aviator and aircraft designer, born. Aeroplane, 1 38.

- 28** 1759 William Pitt the Younger, English statesman, born, 6 208 Napoleon I, 5 322, United Kingdom, 7 348
 1779 Thomas Moore, Irish poet, born Irish Republic, 4-287
 1911 Chekhov's comedy *The Cherry Orchard* first played in England. Drama, 3 122, Russian Literature, 6 480
 1932 Completion of dam cutting off the Zuider Zee (now IJsselmeer) from open sea. Dam, 3 30

- 29** OAK APPLE DAY, 5-469.
 1660 Entry of Charles II into London at the Restoration. English History, 3 280
 1860 Opening of Queensland's first Parliament, 6 324 British Commonwealth, 2-84, Australia, 1 318
 1874 Gilbert Keith Chesterton, English writer born 2 311 English Literature, 3 291
 1953 Everest first climbed by Sir Edmund Hillary and Tenzing, 3-320, Himalayas, 4 176, Mountain climbing, 5 284

- 30** 1431 Joan of Arc burned at the stake 4-376 Charles VII, 2-308, Hundred Years War 4 304, France History, 3-450
 1860 Tristan da Cunha islands became British Albatross, 1-92, Shearwaters, 7-20
 1906 Simplon Tunnel through the Alps opened to traffic Alps 1-126, Tunnels 7-326
 1935 Earthquake at Quetta—approximately 42,000 deaths Baluchistan, 1 358 Earthquakes, 3-153 Pakistan, 6 44
 1942 Thousand bomber R A F raid on Cologne World Wars, 7 492
- 31** 1819 Walt Whitman, American poet, born, 7 449 Poetry, 6 235, United States Literature, 7-364
 1902 Peace of Vereeniging, ending Boer War, 1-503
 1910 Union of South Africa established, anniversary celebrated as Union Day South Africa, 7 92
 1916 Battle of Jutland (ending 1 June), 4 390
 Jellison 4 359 World Wars 7 481



May 31, 1916 The *Seydlitz* German battle-cruiser of 25,000 tons (above), burning fiercely, hit at the Battle of Jutland



JUNE

Nature Notes Midsummer Day falls in this month of flowering. June, the month of wild dog roses and sweet briar and all the garden roses (6-453). Sweet honeysuckle (4-190) is in flower, and wild flag irises (4-294), water lilies (7-428) in ponds and sluggish streams, watercress (7-127) in wayside ditches, and in waste places and odd corners the nettles (5-393). Those strange flowerless plants the fungi are represented by white or grey puffballs (3 facing p. 489) sometimes as large as a foot ball. The flycatcher (3-102) is living up to its name, and the wagtail (7-109) restlessly running or walking keeps its tail always wagging. Early morning dew (3-82) sparkles on the spiders' webs (7-152), and when the sun strikes hot on the grass there is much brisk chirping, and leaping of grasshoppers (4-61). Skipper butterflies (2-139-140) and fritillaries (2-138) are among June's numerous lepidoptera (4-269). Ladybirds (4-430) and their hungry larvae are busy among the aphids (4-182) and there is much to wonder at in the swarming of the bees (1-105). A fleeting glimpse is had of a dormouse (3-107) among the trees and bushes where it lives. Silently rabbit hunting or the guinea pig or toad (3-215) and the slightly smaller but no less bloodthirsty weasel (7-155). The blinding of tapes and hives amid the teeming life affords plentiful instances of protective coloration (6-236).

- 1** 1701 Act of Settlement (regulating succession to the British throne). Royal Family, 6-463.
1831 James Clark Ross located North Magnetic Pole as it then stood. Polar Exploration 6-242, Magnetism, 5-83, North Pole, 5-460.
1875 John Maschfield, English poet, born, 5-144.
English literature 3-291, Poet Laureate, 6-232.
1941 British forces evacuated Crete, 2-527. World Wars, 7-490.

- 2** 1793 Opening of the Reign of Terror in France. France, History, 3-451. French Revolution 3-469.
1857 Sir Edward Elgar, British composer, born, 3-227. Music, 5-306.
1910 C. S. Rolls flew the English Channel in both directions. Aeroplanes, 1-39.
1953 Coronation of Queen Elizabeth II, 3-234. Coronation, 2-500, Crown Jewels, 2-536.

- 3** 1804 Richard Cobden, British politician, born 2-435. Bright, 2-69, Peel, 6-105.
1865 George V, King of Great Britain, born, 3-520. Edward VII, 3-169, Edward VIII, 3-169. Mary, Queen, 5-141; United Kingdom, 7-352.
1876 Lactose introduced into England from Montreal, 4-435.
1918 Penny postage in Britain abolished. Post Office, 6-270, Stamps, 7-143.

- 4** 1738 George III, King of Great Britain (reign 1760-1820), born, 3-521. Eton, 3-304, United Kingdom, 7-347.
1917 Order of the British Empire instituted. Orders and Decorations, 5-530.

- 1940 Dunkirk evacuation completed 3-136. World Wars, 7-487.

- 1944 Rome liberated by the Allies. World Wars 7-494.

- 5** 755 St. Boniface, Apostle of Germany, murdered 1-519.

- 1723 Adam Smith, British economist, born 7-71, Economics, 3-149.

- 1849 Denmark's liberal constitution came into force anniversary kept as Constitution Day 3-74.

- 1916 Lord Kitchener drowned 4-415.

- 1947 George C. Marshall, U.S. Secretary of State outlined at Harvard the 'Marshall Plan' to assist Europe, 5-137, European History, 3-319. United States, History, 7-363.

- 6** 1599 Diego Rodriguez de Silva y Velazquez Spanish painter, baptised, 7-353, Murillo 5-297, Painting, 6-31, Spanish Art, 7-121.

- 1871 Alsace annexed to Germany, 1-126; Franco-Prussian War, 3-158, France, History, 3-453. Germany, History, 4-8.

- 1944 D-Day Allied invasion of Normandy, 5-470. European History, 3-319, France, 3-453, World Wars, 7-494.

- 7** 1566 Foundation Stone of London's first Royal Exchange (destroyed in the Great Fire) laid by Sir Thomas Gresham. London, 5-20. Lloyd's, 4-522.

- 1811 Sir James Young Simpson, Scottish physician born. Anaesthesia, 1-143, Medicine, 5-165.

- 1832 Reform Bill received the Royal Assent. Parliament, 6-88. United Kingdom, 7-349. Vote, 7-407.

JUNE

1848 Paul Gauguin, French artist, born in Paris France: Art, 3 449; Post-Impressionists, 6 207.
1921 First Parliament of Northern Ireland opened. 5 158; Ireland, 4 283.

8 **1652** William Dampier, English navigator, baptised, 3 36; Australia, 1 317.
1810 Robert Schumann, German composer, born, 6 507; Music, 5 305.

1821 Sir Samuel White Baker, English explorer, born, 1 347; Africa, 1 51.

1829 Sir John Everett Millais, British painter, born, 5-201. English Art, 3-262; Carlyle, 2 243 (picture), Huguenots, 4 201 (picture); Martyrs, 5 138 (picture), Moses 5 271 (picture); Pre-Raphaelites, 6 284

1929 Ramsay MacDonald's second Labour government took office, 5 62; Labour Party, 4 427 Socialism, 7 81; United Kingdom, 7 352.

9 **1781** George Stephenson born, 7 155 Loco motives, 5 1; Steam Engine, 7 154.
1815 Treaty of Vienna signed European History, 3 316 (picture).

10 **1688** James Francis Edward, the "Old Pretender," born. Jacobites, 4 334. James, Kings of Great Britain, 4 340.

1829 First Oxford-Cambridge boat race Rowing, 6 159.

1940 Italy declared war on Britain and France, 4 317; Mussolini, 5 311; World Wars, 7 488.

11 **1685** James, Duke of Monmouth, landed at Lyme Regis to seize the throne. Charles II, 2 308; James, Kings of Great Britain, 4 339. Jellies, 4 359

1776 John Constable, British painter, born, 2 487. English Art, 3 260, 268 (picture); National Gallery, 5 328; Painting, 6 34.

1847 Sir John Franklin, Arctic explorer, died, 3 461. Polar Exploration, 6 242

1864 Richard Strauss, German composer, born, 7 172 Opera, 5 520



June 13 1944 German flying-bomb, a jet-propelled pilotless aircraft, used near end of the Second World War

12 **1700** Sir John Cotton's Library presented to the nation. British Museum, 2 88

1819 Charles Kingsley, English divine and author, born, 4 409 Children's Books, 2 356, 357 English Literature, 3 291

1837 First electric telegraph patented by Cooke and Wheatstone, 7 237 Cable, 2 152; Morse, 5 268

1851 Sir Oliver Joseph Lodge, English scientist, born, 5 14; Radio, 6 341, 343

13 **1795** Dr. Thomas Arnold, British headmaster, born, 1 254; School, 6 503

1841 First Canadian Parliament opened at Ottawa British Commonwealth, 2 84; Canada 2 200; Ottawa, 6 9

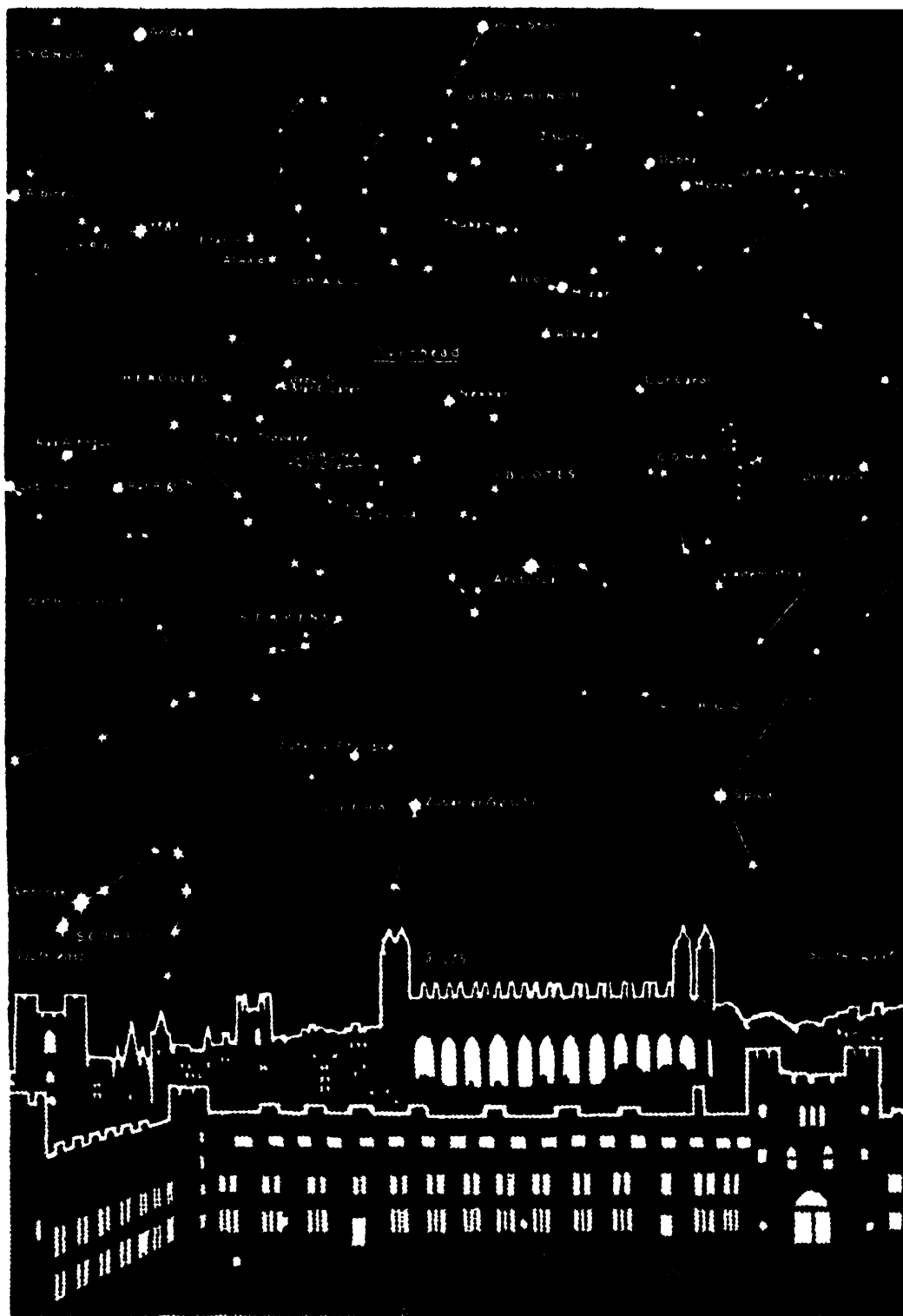
1865 William Butler Yeats, Irish poet and dramatist, born Irish Literature, 4 287

1944 First flying bomb fell on London. Flying Bomb, 3 404 London, 5 28 World Wars, 7 495



June 13, 1795 Rugby School became famous under control of Thomas Arnold Above is seen the Headmaster's House

JUNE



THE STARS IN JUNE. With this you can study the stars from the middle of June to the middle of July. You are looking south in Cambridge, towards King's College Chapel. Antares in Scorpio is a beautiful red star

JUNE

14 1645 Battle of Naseby. Charles, British Kings, 2-307; Cromwell, Oliver, 2-534; English History, 3-278.

1811 Harriet Beecher Stowe, author of *Uncle Tom's Cabin*, born. Slavery, 7 66; United States: Literature, 7 304.

1919 First Atlantic flight started (Alcock and Whitten Brown). Aeroplane, 1 41.

1940 German forces occupied Paris, 6-85; France: History, 3 453; World Wars, 7-488.

15 1215 Magna Carta sealed by King John at Runnymede, 5 80. English History, 3-277; Government, 4 50; John, King, 4 378.

1330 Edward the Black Prince born at Woodstock. Hundred Years' War, 4 204; Richard, Kings of England, 6-399.

1389 Turkish victory over the Serbs at Kossovo. Serbin, 6-532; Turkey, 7 333; Yugoslavia, 6 532.

1571 Harrow School founded. Middlesex, 5-200; School, 6 505 (picture).

1951 Lake District made a national park, 4 43b. Cumberland, 3 9; Westmorland, 7-444; Wordsworth, 7 477.

16 1722 John Churchill, Duke of Marlborough died, 5-131. Anne, Queen, 1 158; Blenheim, Battle of, 1-484.

1920 First public meeting of League of Nations council, in London, 4 464.

17 1239 Edward I, King of England, born, 3 166. English History, 3 277; Montfort, Simon de, 5-252; Parliament, 6 86.

18 1643 John Hampden, English statesman and patriot, mortally wounded at Chalgrove Field, 4-123; Buckinghamshire, 2 105.

1815 Battle of Waterloo, 7-428; Blucher, 1-494; Napoleon I, 5-323; United Kingdom, 7 349; Wellington, Duke of, 7 437.

1829 Metropolitan Police of London organized. Peel, 6-105; Police, 6 247.

19 1566 James I, King of Great Britain, born, 4-338; Fawkes, Guy, 3-343; Mary Queen of Scots, 5-142.

1623 Blaise Pascal, French philosopher and scientist,



June 14 1919 Sir John Alcock (above, left) with Sir Arthur Whitten Brown. They achieved the first Atlantic flight.

born. Calculating Machines, 2 167; France: Literature, 3-455; Hydraulics, 4 214; Mathematics, 5-147.

1861 Earl Haig, British army commander, born, 4 117; World Wars, 7 479, 481.

1867 Maximilian, Emperor of Mexico, shot. Mexico, 5 189.

1895 Kiel Canal opened. Canal, 2 207; Germany, 4 3.

20 1756 Black Hole of Calcutta, 2 172. Clive, Lord, 2 411.

1837 Death of William IV and accession of Victoria. William, Kings of England, 7 452; Victoria, Queen, 7 395.

1920 British government promised independence to Mesopotamia, 5-176; Iraq, 4-278.

21 LONGEST DAY OF THE YEAR. Equinox, 3 295; Seasons, 6 526.

1875 Foundation stone of new St. Paul's Cathedral laid, 6-487; Architecture, 1-217; Cathedral, 2 204; London, 5 20, 32 (picture); Wren, Sir C., 7 500.

1942 Tobruk lost to Germans, World Wars, 7 492.

22 1805 Giuseppe Mazzini, Italian patriot, born, 5-151. Italy, 4 316.

1940 Franco-German armistice signed at Compiègne. France: History, 3-453; World Wars, 7-488.

1941 Invasion of Russia by Germany, 4-11; European History, 3 319; Russia, 6 476; World Wars, 7-490.

23 79 Roman Emperor Vespasian died. Rome: History, 6-439.

1757 Battle of Plassey. Calcutta, 2-173; Clive, 2-411; India: History, 4-252.

1870 Opening of Keble College, Oxford, 6-18.

1879 William Ewart Berry, 1st Viscount Camrose, born, 2-194.

1918 Beginning of Italian offensive on the Piave. World Wars, 7-483.

24 MIDSUMMER DAY. Month, 5-255; Seasons, 6 526.

1314 Battle of Bannockburn, 1-365; Bruce, Robert, 2 96; Scotland, 6 512.

1340 Battle of Sluys. Hundred Years' War, 4-203.

1859 French defeated Austrians at Solferino. Red Cross Societies, 6-370.



June 15, 1951 Ullswater (above) in the Lake District, as seen from Glencoyne Park—a National Trust property.

JUNE



June 26, 1553 The band of Christ's Hospital or Blue Coat School, near Horsham Sussex in traditional costume

25 1891 First Sherlock Holmes story published in the *Strand Magazine*. Doyle Sir A C 3 111

1917 First U.S. troops landed in France World Wars 7 482.

1950 North Koreans invaded South Korea, 4 426, United Kingdom, 7 354, United States History 7-363.

26 1553 Christ's Hospital granted its charter Edward, Kings of England, 3-169, Lamb, 4-441, Coleridge, 2-448, School, 6 505 (picture).

1763 George Morland, English artist, born English Art, 3-264.

1824 Lord Kelvin, British physicist, born, 4 395 Cable, 2 155, 154, Joule, 4-385, Radio, 6-341

1945 United Nations Charter signed by 50 nations at San Francisco, 6 497 United Nations, 7 354.

27 1846 Charles Stewart Parnell born, 6 91.
1880 Helen Adams Keller, American blind deaf-mute, born, 4 395, Blind, Education of the, 1 485

28 1491 Henry VIII, King of England, born, 4 163, English History, 3 277 More, 5 262, Reformation 6-377, Wolsey, 7 466

1712 Jean Jacques Rousseau, French philosopher, born, 6 459 France Literature, 3 455, French Revolution, 3 466

1914 Assassination of Archduke Francis Ferdinand at Sarajevo Bosnia, 2 20, European History, 3 316, Serbia, 6 532, World Wars, 7 478

1919 Treaty of Versailles, ending the First World War, signed European History, 3 317; Versailles 7 394 World Wars, 7 484

29 1577 Peter Paul Rubens, Flemish artist born, 6 468, Loyola, 5 48 (picture) Netherlands Art, 5 381 387 (picture) Painting, 6 34

1613 Shakespeare's Globe Theatre burnt down Shakespeare, 7 13 (picture), Theatre, 7 265

1855 First issue of the *Daily Telegraph* published Camrose, 2 104 Newspapers, 5 406

1916 Sir Roger Casement condemned to death for high treason Ireland, 4 283

1927 Total eclipse of the sun visible in northern England Eclipse, facing pp 156, 158

30 1837 Use of pillory abolished by Parliament Dolor, 3 65 Prisons, 6 291

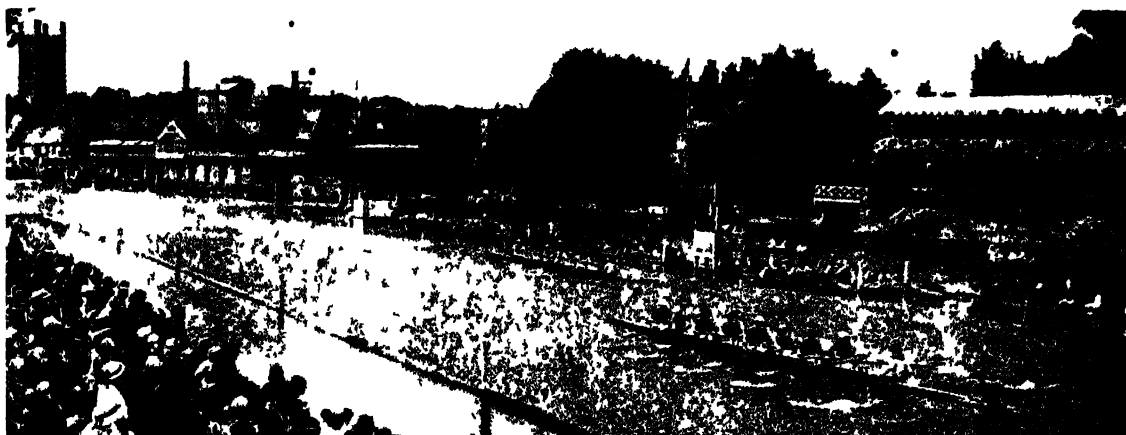
1894 Tower Bridge opened Bridge, 2 68 (picture), London, 5 20, 29 (picture), Thames 7 263.

1934 Rohm and other Nazis murdered on Hitler's orders ('Night of the Long Knives') Germany History, 4 10, Hitler, 4 182

1940 German forces occupied the Channel Islands 2 303



June 25, 1891 Many admirers of the fictitious amateur detective, Sherlock Holmes, have vainly searched for his consulting rooms at "221B, Baker Street" Above is seen a skilful reconstruction of his celebrated sitting-room



JULY

Nature Notes Purple heather (4 148) stretching to the horizon beneath a sweltering sun is a goodly sight—and to it bees flock in multitudes to collect from the flowers nectar for their honey making. Associated with heather is the hutchell (4 191), the true Huchell of Scotland. Entirely different is the landscape featuring tall willowherb (7 155), deadly hemlock (4 161) with flat white flower heads, bulrush and reedmace (2 123), arrowweed (7 160) lifting white blossom above sluggish water—and on the surface of a pond, a green carpet of duckweed (7 129) speckled with extremely small flowers. The strange sundew (7 190) of moist places extends a slender flower stalk from its crimson tinted rosette of insect catching leaves. The flash of a kingfisher (4 404) downstream contrasts with the somewhat leisurely flight from tree to tree of the black and white chattering magpie (5 86). High overhead a kestrel (4 140) hovers almost motionless scanning the ground for food. A familiar call will be lacking for another year—the cuckoo (3 7) leaves this month or next for South Africa. Big caterpillars (2 263) of hawk moths (2 144) are eating their fill of leaves of lime tree (4 509) and poplar (6 259). A sudden eruption of flying ants (1 160) marks a bug at swarming from crowded nests. A toad (7 268) disturbed from this thundant feast makes no great hurry to depart—it crawls awkwardly away unlike the toad frog which hops and jumps.

1 1690 (Old Style) Battle of the Boyne, 2 32, anniversary celebrated as Orange Day in N. Ireland on July 12. Ireland, 4 262. James, Kings of England, 4 340. William, Kings of England, 7 452.

1867 Dominion of Canada founded, 2 200, anniversary kept as Dominion Day. British Commonwealth, 2 82, 83.

1900 Bernard Shaw's comedy *Candida* first played. Drama, 3 122.

1911 Dispatch of German gunboat *Panther* to Agadir, Morocco, caused grave international tension. Morocco, 5 265.

1916 First Battle of the Somme began. World Wars, 7 479, 480 (picture).

1946 Experimental atomic bomb exploded at Bikini Atoll (a second on July 24). Atomic Energy, 1 304, 305. Japan, 4 350. World Wars, 7 498.

2 1489 Thomas Cranmer, Archbishop of Canterbury, born, 2 526. Henry, Kings of England, 4 164.

1644 Battle of Marston Moor. Charles, British Kings, 2 307, Cromwell, 2 534, English History, 3 278.

3 1866 Austrians defeated by the Prussians at Sadowa (Koniggratz). Germany. History, 4 8.

1900 Count Zeppelin, German aeronaut, made the first flight in a rigid airship. Airship, 1 83.

4 1776 Declaration of American Independence, 1 139, United States: History, 7 361. Washington, George, 7 120.

1804 Nathaniel Hawthorne, American writer, born,

4 142, Children's Books, 2 357. United States Literature, 7 364.

1946 Philippine Islands became an independent republic, 7-157. Pacific, 6 26, 29-31. United States History, 7 362.

5 1781 Sir Stamford Raffles, founder of Singapore, born—he died on the same date in 1826. British Commonwealth, 2 85, Singapore, 7 56.

1803 George Borrow, English writer and friend of the Gypsies, born, 2-20.

1853 Cecil Rhodes, British statesman and Empire pioneer, born, 6 393. British Commonwealth, 2 85, Cape Town, 2 218, South Africa, 7 91-92.

1945 U.K. general election gave Labour party its first absolute majority. Attlee, 1 306, Labour Party, 4 427, Socialism, 7 81, United Kingdom, 7 353.

1948 National Health Service came into operation in the U.K. Insurance, 4 271, United Kingdom, 7 354.

6 1415 John Huss, Bohemian reformer and champion of Czech nationalism, burned at the stake, 4 211, Czechoslovakia, 3-71. Reformation, 6-376.

1685 Battle of Sedgemoor, last battle fought on English soil, the Duke of Monmouth defeated by the troops of James II. James, Kings of Great Britain, 4 339, Jeffreys, 4 359.

1809 Napoleon defeated Archduke Charles of Austria at Wagram. Napoleon I, 5-322.

1928 First sound film, *The Lights of New York*, shown in New York. Cinema, 2 395.

JULY



July 10, 1943 British troops are here seen wading ashore from landing-craft during the Allied invasion of Sicily

- 7** **1762** Joseph Marie Jacquard, French inventor, born. Automatic Control, 1 327. Jacquard Loom, 4 335; Lace, 4 432; Weaving, 7 435
- 1853** Captain Perry's arrival in Japan led the way to contact with the west, 4 349
- 1929** Vatican constituted a sovereign state, 7 342
- 1937** China-Japan conflict began, anniversary kept in China as Double Seventh Day, 2 375 Japan, 4 350; Manchuria, 5 112
- 8** **1621** Jean de la Fontaine, French poet and fabulist, born, 4 437; France Language and Literature, 3 455.
- 1822** Poet Shelley drowned at Spezia, 7 24. English Literature, 3 289

- 1836** Joseph Chamberlain, British statesman, born, 2 300. Conservatives, 2 48.
- 1889** Last bare-knisted boxing match (Sullivan v. Kilrain, 75 rounds) Boxing, 2 30.
- 1913** Serbia declared war on Bulgaria Balkan Peninsula, 1 350. Bulgaria, 2 121, Serbia, 6 532. Yugoslavia, 7 519

- 9** **1915** German South West Africa surrendered to General Smuts, 7 72. South Africa, 7 92. World Wars, 7 480
- 1919** Germany ratified the Treaty of Versailles Germany History, 4 9. Versailles, 7 304. World Wars, 7 483.
- 1944** British troops captured Caen, 2 160. World Wars, 7 495.

- 10** **1509** John Calvin, French reformer, born, 2 178. Christianity, 2 380. Geneva, 3 512. Reformation, 6 376, 377
- 1584** William the Silent assassinated, 7 454. Belgium, 1 417
- 1792** Captain Frederick Marryat, English sailor and novelist, born, 5 136. Children's Books, 2 356
- 1943** Allied invasion of Sicily, 7 50 Alexander Lord, 1 100. Italy History, 4 317. World Wars, 7 494

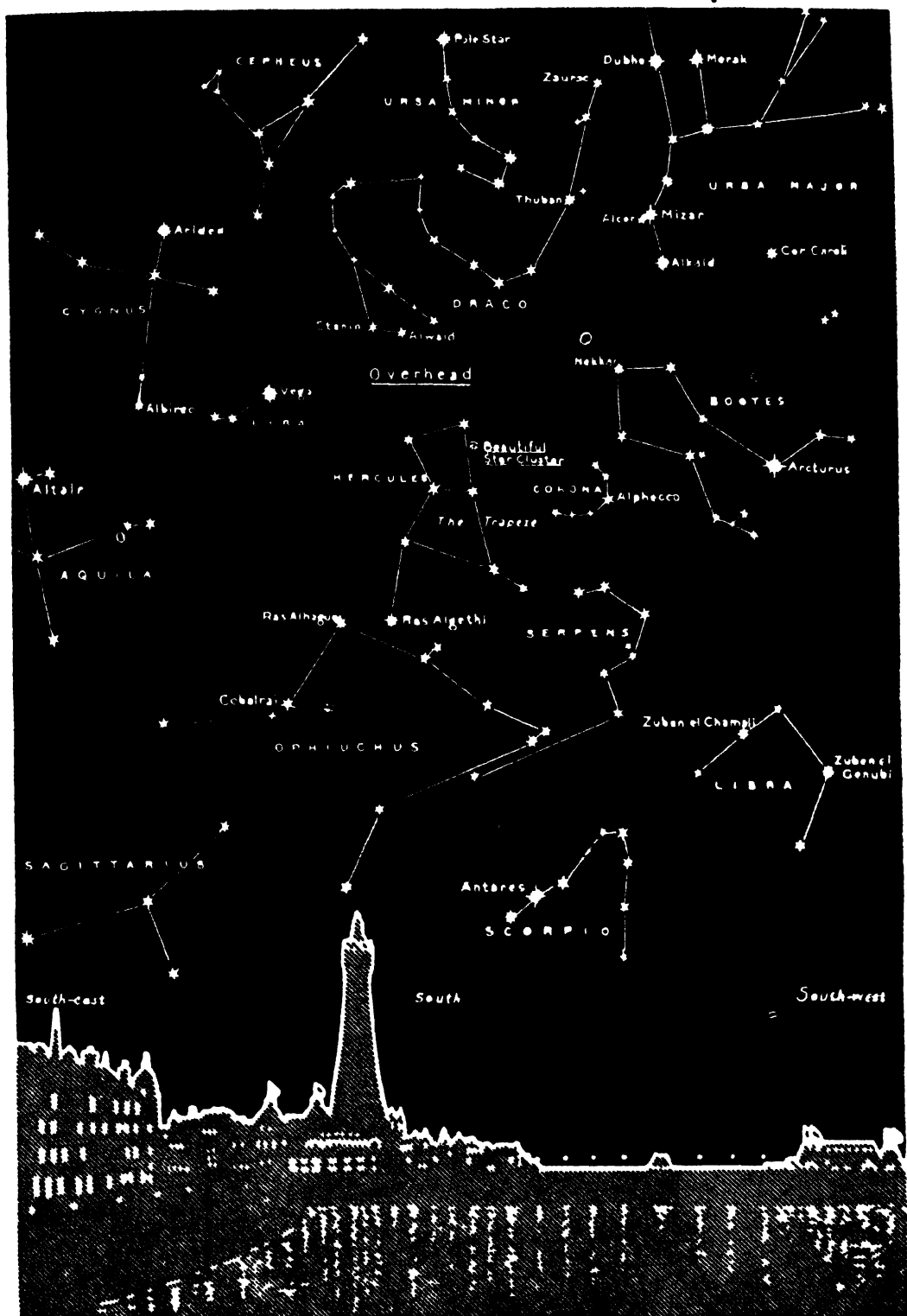
- 11** **1274** Robert Bruce born 2 96. Bannockburn, 1 365 Scotland 6 512
- 1708** Battle of Oudenarde Marlborough 5 131
- 1882** Bombardment of Alexandria, 1 102. Egypt Modern, 3 176

- 12** **1099** Capture of Jerusalem by the Crusaders, 4 363. Crusades, 3 1
- 1174** Henry II did penance at Canterbury for murder of Becket Becket, 1 401. Canterbury 2 213. Henry, Kings of England, 4 162
- 1854** George Eastman, American inventor, born Photography, 6 170



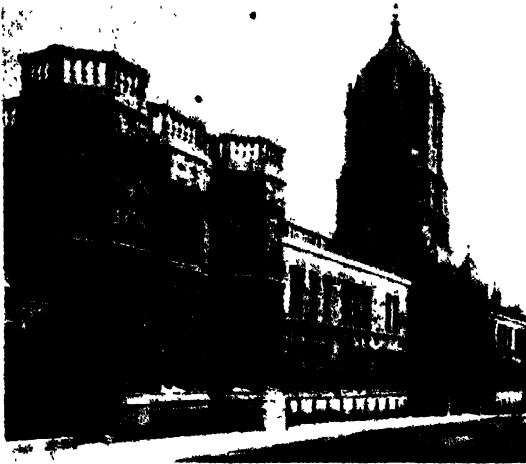
July 8, 1822. "Casa Magna," Shelley's house at Lerici, on the Gulf of Spezia, Italy, is seen above. The boat *Ariel* in which the poet was wrecked in a squall on this day, when returning from Leghorn, is shown on the left.

JULY



THE STARS IN JULY With this you can study the stars from the middle of July to the middle of August. You are looking southward at Blackpool, but the holiday-maker will find the same grand spectacle wherever he may go in Britain. This is the best time of year to contrast the orange-red star Arcturus with the steely blue Vega.

JULY



July 13, 1525. Christ Church, Oxford (above), originally founded by Cardinal Wolsey, refounded by Henry VIII.

1870 Victoria Embankment opened by Prince of Wales (Edward VII). London, 5 21.

13 **1525** Christ Church, Oxford, founded as Cardinal College by Cardinal Wolsey. Oxford, 6-17; Wolsey, 7-467.

1793 Assassination of Jean Paul Marat by Charlotte Corday, 5-120; France: History, 3-451; French Revolution, 3-468 (picture), 469.

1915 Beginning of big offensive by Germans and Austrians against Russia. World Wars, 7-480.

14 **1602** Jules Mazarin, French cardinal and statesman, born. Louis XIV, 5 41; Opera, 5-513.

1789 Bastille taken by Paris mob; commemorated as national fete, *Le Quatorze Juillet*. French Revolution, 3-466; Paris, 6-79.

1865 First ascent of the Matterhorn by Edward Whymper. Alps, 1-126.

1940 Annexation of Estonia, Latvia, and Lithuania by the Soviet Union, 3-290, 4-453, 524; Russia, 6-477, 478; World Wars, 7-490.

15 St. SWITHIN'S DAY, 6-488.

1573 Inigo Jones, English architect, born. 4 381; Architecture, 1-212.

1606 Rembrandt van Rijn, Dutch painter, born. 6-382; Etching, 3-300; Netherlands: Art, 5 383, 388 (picture); Painting, 6 34.

1662 Charter granted to the Royal Society, 6 463; Wren, 7-501.

1933 Wiley Post began the first solo flight round the world. Aeroplane, 1-42.

16 **622** Mahomet began his *hijra* (flight from Mecca). Muslims reckon dates from this day, 5 88.

1723 Sir Joshua Reynolds, English painter, born. 6-389; English Art, 3-259, 266 (picture); English Literature, 3 286 (picture); Gainsborough, Thomas, 3-497; Painting, 6-36 (picture).

1951 Abdication of Leopold III of Belgium, 1-419; Leopold, Belgian Kings, 4-485.

17 **1796** Camille Jean Baptiste Corot, French painter, born, 2-512; France: Art, 3-440.

1917 British Royal Family became the House of Windsor. George V, 3-522; Royal Family, 6 463; Windsor, 7-460.

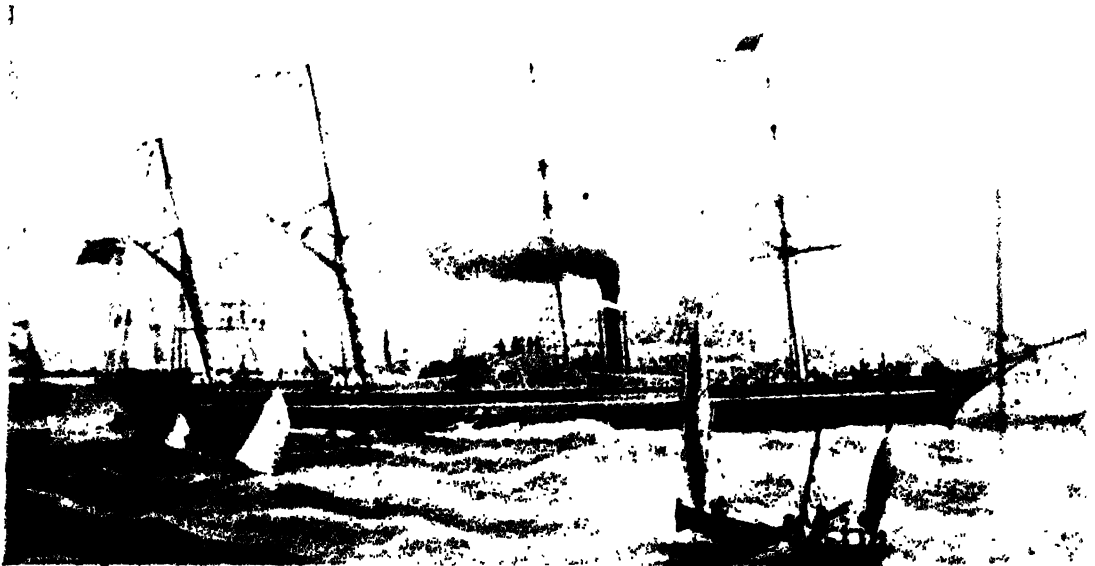
1936 Civil War began in Spain, 7-110; European History, 3-317; Franco, 3 457.

1945 Potsdam Conference opened. Stalin, 7 112; Truman, 7 322; World Wars, 7 485-6.

18 **1811** William Makepeace Thackeray born, 7 261; English Literature, 3-291; Novel, 5 472.

1870 Doctrine of Papal Infallibility promulgated. Papacy, 6 461; Roman Catholic Church, 6 426.

1918 Allied offensive against Germans began. Foch, 3 404; World Wars, 7-482.



July 19, 1837. The *Great Western* was launched. Designed by Isambard Kingdom Brunel, and built at Bristol under her designer's superintendence, she was the first steamship to make regular voyages across the Atlantic.

JULY



July 25, 1909. Louis Blériot in front of the aeroplane, became the first man to fly across the English Channel

1884 Mersey Tunnel opened by King George V. Birkenhead, 1-472; Liverpool, 4 524 (picture). 525 (picture); Tunnels, 7 326, 327 (picture), 328.

19 1588 Spanish Armada sighted. Armada, 1 241; Drake, Sir F., 3-113; Elizabeth I, 3-251; English History, 3-277.

1837 Steamship *Great Western* launched. Brunel, 2 99; Ships, 7-29, 37 (picture).

1924 Liverpool Anglican Cathedral consecrated, 4 525; Cathedrals, 2 264.

20 1304 Petrarch, Italian poet, born. Italian Literature, 4 329; Poetry, 6-234.

1944 Attempted assassination of Adolf Hitler, 4 183.

1951 Assassination of King Abdullah of Jordan, 4 382.

21 1403 Battle of Shrewsbury and death of Hotspur. Henry, Kings of England 4-162; Shropshire, 7-45.

1831 Belgium became a separate kingdom under Leopold I, 1 417; anniversary kept as Independence Day. Leopold, 4 484.

1897 Tate Gallery (London) opened, 7 229.

22 1286 Battle of Falkirk. Edward I, 3 167. Scotland, 6-512; Wallace, 7 415.

1822 Gregor Mendel, Austrian scientist, born, 5-168; Heredity, 4 168.

1847 First Mormons camped at Great Salt Lake. Mormon, 5-264; Utah, 7-371.

23 1423 Louis XI of France born. Louis, Kings of France, 5-41.

1745 Charles, Young Pretender, landed at Eriskay, in the Hebrides. Jacobites, 4-335.

1952 Military revolution in Egypt, led by General Nguib, deposed King Farouk. Egypt, 3-130.

24 1701 First settlement at Detroit, 3-80.

1704 Capture of Gibraltar, 4 20.

1783 Birth of Simon Bolivar, liberator of South America, 1-506; Bolivia, 1-507; South America, 7-98.

1802 Alexandre Dumas the Elder, French novelist, born, 3-133. Novel, 5-472.

1923 Treaty of Lausanne between Turkey and Allied powers. Turkey, 7 336.

25 1554 Marriage of Mary I to Philip of Spain. Mary, Queens of England, 5 140; Philip, Kings of Spain, 6 155; Elizabeth I, 3 230.

1909 Louis Blériot, French aviator, made the first cross-Channel aeroplane flight, 1 485. Aeroplane, 1-33.

1934 Engelbert Dollfuss, Austrian chancellor, murdered by Nazis. Vienna, 7 399; World Wars, 7 486.

1943 Mussolini resigned, 5 311; Fascism, 3 342; Italy: History, 4-317.

26 1847 Liberia, the Negro republic, declared independent, 4 485; Slavery, 7 66.

1875 Carl Jung, Swiss scientist, born, 4 386; Psychiatry, 6 300 (picture).

1921 Treaty of Trianon, between the Allies and Hungary, came into force. Hungary, 4-207.

27 1809 Battle of Talavera. Wellington, 7 437; Peninsular War, 6-117.

1836 Adelaide, S. Australia, founded, 7-18; Australia, 1 318; South Australia, 7-102.

1870 Hilaire Belloc, British author, born, 1-423. Chesterton, G. K., 2 332.

1953 Armistice between North Koreans and United Nations forces signed. Korea, 4-426; United States: History, 7-363.

28 1794 Robespierre guillotined: French "Reign of Terror" ended, 6-415; French Revolution, 3 469.

29 1801 George Bradshaw, originator of railway guides, born, 2-38.

1929 J. B. Priestley's novel *The Good Companions* published, 6 287.

1948 Opening of 14th Olympic Games at Wembley; Olympic Games, 5 509, 510.

30 1818 Emily Jane Brontë born, 2-91; English Literature, 3 291.

1863 Henry Ford, American manufacturer, born, 3 417; Motor Vehicles, 5-280 (picture), 283.

31 1851 U.S. yacht *America*, first winner of *America's Cup*, reached Cowes. Yachts and Yachting, 7 509.

1908 Boy Scout movement instituted by Sir Robert Baden-Powell, 2-33; Baden-Powell, 1-345; Girl Guides, 4 22.



July 28, 1794. Robespierre, French revolutionary leader, met his death at the guillotine. On the previous day, in trying to evade his enemies, he had been wounded (above picture)



AUGUST

Blackberries are ripening (1 177) in great abundance, and bilberries (1 145). Very tempting, too, in appearance are the showy berries of bittersweet (1 177) and nightshade (5 439), but both are poisonous. The fall forest (7 235) in flower never fails to attract attention. Thistle-down (7 270) is floating in the wind, a notable instance of seed distribution (6 528). Hops (4 192) are ripe and, my day now, will see great activity among the aromatic vines. Cornfields are golden, and harvesting (4 134) of the wheat begins. The diminutive harvest mouse (5 288) finds the occasion full of unwelcome excitement. The distinction of being a game bird falls heavily on the grouse (4 99); the shooting season opens on the 12th. For many kinds of bird, fallen silent now that family activities are over, the annual autumn moult (1 169) commences. A holiday by the sea offers first-hand acquaintance with the intriguing habits of a great diversity of creatures: the commonest including starfish and sea-urchin (7 150), cockles and mussels (2 437), jellyfish (4 360) and crabs (2 523) and, in shallow rock pools, sea anemones (6 524). There is much wonder in the forms and colours of shells (7 24) and of seaweed (6 526) tossed up on the beach. Fossils (3 124) in, sometimes, be found by searching among the debris of the cliffs and rocks (6 424).

1 1759 Battle of Munden, French defeated by British and Hanoverians. Seven Years War, 7-2.

1798 Battle of the Nile, at which Nelson destroyed the French fleet. Nelson, Lord, 5 363, Nile, 5 410.

1831 London Bridge opened. London, 5 20, Thames, 7 263.

1834 Emancipation of slaves in all British dominions. Slavery, 7 66.

1874 Discovery of DDT, first announced. Antibiotics, 1-174.

1944 Rising against Germans in Warsaw under "General Bor". Warsaw, 7 420, World Wars, 7 496.

2 216 *sc* Hannibal's victory over Rome at Cannae, 4-127, Carthage, 2 255, Rome. History, 6 432.

1100 William Rufus shot in the New Forest. William Kings of England, 7 452.

1858 Government of India transferred from the East India Company to the Crown. British Commonwealth, 2 84, India: History, 4 253, United Kingdom, 7 350.

3 1805 First recorded Eton v. Harrow cricket match. Eton, 3-305.

1829 First use of cornet in an orchestra (Rossini's *William Tell*, in Paris). Trumpet, 7 322.

Germany declared war on France. France. History, 3-453; Germany: History, 4 9; World Wars, 7-478.

4 1265 Simon de Montfort defeated at Evesham, 5 252; Edward I, 3 166, Henry III, 4 162.

1347 Calais surrendered to the English, 2 106. Hundred Years' War, 4 204.

1914 Great Britain declared war on Germany. Germany: History, 4 9, United Kingdom, 7 351. World Wars, 7 478.

1940 Italians invaded Kenya, the Sudan, and British Somaliland. World Wars, 7 489.

5 1583 Sir Humphrey Gilbert took possession of Newfoundland, 5 395. America: Discovery, 1 134, British Commonwealth, 2 282.

1850 Guy de Maupassant, French novelist, born. French Literature, 3 456.

1858 First Atlantic cable from England to America laid. Cable, 2 153, Morse, 5 208.

1915 Warsaw fell to Germans, 7 419.

1924 Turkey abolished polygamy, 7 336, Kemal Atatürk, 4 397, Marriage, 5 123.

6 1806 End of the Holy Roman Empire, 4 188, Germany: History, 4 8, Hapsburg House of, 4 130, Napoleon I, 5 322.

1809 Alfred, Lord Tennyson, English poet, born, 7 257. English Literature, 3 290, Poetry, 6 235.

1915 Anzacs landed at Suvla Bay, Gallipoli. Dardanelles, 3 49, World Wars, 7 479 (picture), 480.

1926 Gertrude Ederle swam the Channel - the first woman to do so. Swimming, 7 210.

1945 Atomic bomb dropped on Hiroshima. Atomic Energy, 1 303; Japan, 4 350; Truman, H. S., 7 322, World Wars, 7 498.

7 1858 Ottawa proclaimed capital of Canada, 6 10; Canada, 2 202, Ontario, 5 512.

1904 British entered Lhasa, forbidden city of Tibet. Tibet, 7 274.

1942 U.S. troops landed on Guadalcanal. World Wars, 7 491 (picture).

AUGUST

8 1784 First mail coach run from London to Bristol Road Transport, **6** 411
1786 Summit of Mt. Blanc first reached by Paccard and Balmat Alps **1** 126 Mountain climbing **5** 284

1918 Launching of great Allied offensive which eventually defeated Germany in the First World War Annals, **1** 140 World Wars **7** 182

1940 Decisive period of Battle of Britain opened **2** 78

9 1593 Izak Walton author of *The Compleat Angler* born **7** 418 English Literature **3** 286 Fishing **3** 382

1631 John Dryden English poet born **3** 129 English Literature **3** 287 Poet Laureate **6** 232

1870 Elementary Education Act passed School **6** 304

1896 Otto Lilienthal German pioneer of flying killed while gliding Aeroplone **1** 37 Childer **4** 33

10 1388 Border Battle of Otterburn (Chevy Chase) Ballad **1** 351 Northumberland **5** 461

1637 Edward King subject of Milton's lament Lycidas lost at sea Milton **5** 209 Poetry **6** 235

1675 Royal Greenwich Observatory founded Astronomy **1** 200 Latitude and Longitude **4** 452 Observatory **5** 494

1890 British ceded Heligoland to Germany **4** 159

11 1494 Hans Memling Flemish painter died Netherlands Art **5** 381 382 (picture)

Sir Martin Froisher entered the navy now called after him **3** 471 America **1** 134 135
Liter Exploration **6** 242

1919 Constitution of the German Republic announced at Weimar Germany History **4** 9

12 CROUSE SMOOTHER BEGINS **4** 99 Shooting **7** 42

1827 William Blake English poet died **1** 482, English Art **3** 273 English Literature **3** 288 Job **4** 377 (picture)

1854 Sir Alfred Gilbert British sculptor born Sculpture **6** 521 (picture)

1923 Stresemann became German Chancellor Germany History **4** 9 10 League of Nations **4** 464



August 9 1896 Otto Lilienthal German flying pioneer in his biplane glider above It weighed only some 50 lb.

13 1519 Spanish troops under Cortés captured Tenochtitlan (now Mexico City) **5** 189
Aztecs **1** 331 333 Cortés **2** 113

1704 Marlborough's victory at Blenheim **1** 184 Marlborough **5** 132

1814 Cape Colony ceded to Britain by the Dutch Cape Town **2** 217 British Commonwealth **2** 84 South Africa **7** 90

1898 U.S. forces captured Manila Philippines Manila **5** 113 Philippine Islands **6** 157 United States History **7** 362

14 1870 William I of Prussia set up government in Alsace-Lorraine **1** 126 France History **3** 453 Franco-Prussian War **3** 458 Germany History **4** 8

1880 Cologne Cathedral begun in 1248 completed **2** 456

1925 Shannon hydro-electric scheme contract placed **7** 17 Ireland **4** 285

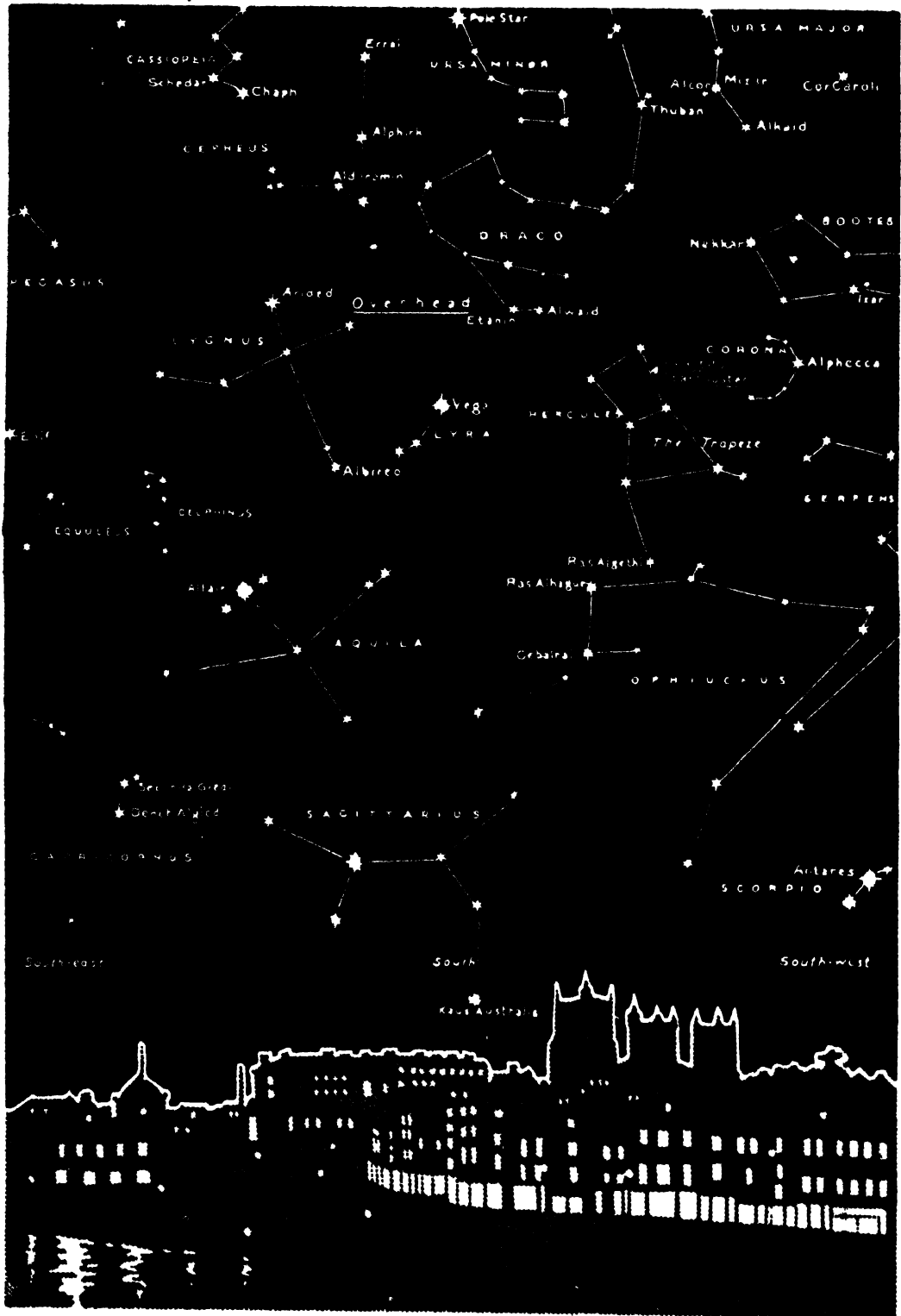
1941 Churchill and Roosevelt signed the Atlantic Charter United Nations **7** 354 Roosevelt **6** 450

1945 Japan surrendered **4** 350 World Wars **7** 498



August 14, 1925 Use of the river Shannon in the Irish Republic, for hydro-electric power, resulted in the generation of many millions of units The Shannon, which below Limerick becomes tidal, is the longest river in Ireland

AUGUST



THE STARS IN AUGUST. With this map those who live in Britain can study the stars from the middle of August to the middle of September. You are looking south in Bristol, and on the right are the towers of the cathedral. On a moonless night the Milky Way can be seen, through Cassiopeia and Cygnus to Sagittarius.

AUGUST

15 1771 Sir Walter Scott, novelist and poet, born, 6-517; English Literature, 3-289; Kenilworth, 4-397; Novel, 5-472.

1785 Thomas De Quincey, English writer, born, 3-75; English Literature, 3-290.

1914 First ship sailed through the Panama Canal, 6-53; Canal, 2-207.

1923 De Valera captured and imprisoned by Irish Free State troops, 3-80; Irish Republic, 4-284.

1945 VJ-DAY. Public holiday in Britain, celebrating surrender of Japan. Japan, 4-350; World Wars, 7-498.

1947 India and Pakistan became dominions. India, 4-254; Pakistan, 6-41.

16 1819 "Peterloo" riots at Manchester, United Kingdom, 7-349 (picture).

1896 Discovery of gold in the Klondike started great "gold rush." Gold, 4-39; Yukon Territory, 7-520.

1914 Russians invaded East Prussia. World Wars, 7-479.

17 1483 Edward V and his brother smothered in the Tower. Edward, Kings of England, 3-167; Richard, Kings of England, 6-400; Roses, Wars of the, 6-454.

1786 Frederick the Great of Prussia died, 3-162; Army, 1-248; Austria-Hungary, 1-326; Blücher, 1-494; France, 3-431; Germany: History, 4-8; Maria Theresa, 5-125; Prussia, 6-299; Seven Years' War, 7-2.

1859 Charles Blondin, French acrobat, first crossed Niagara on a tightrope, 1-488.



August 23, 1939. The Russo-German non-aggression pact was signed: Stalin (left) and von Ribbentrop shake hands.



August 21, 1930. Birthday of Princess Margaret (centre), seen here with her mother and sister (now Elizabeth II).

18 1792 Earl (Lord John) Russell, British statesman, born. United Kingdom, 7-350.

1830 Francis Joseph I, emperor of Austria-Hungary, born. Austria-Hungary, 1-326.

1886 North German Confederation set up. Bismarck, 1-478; Germany: History, 4-8.

19 1879 James Russell Lowell appointed U.S. minister to Great Britain. United States: Literature, 7-364.

1936 British government banned export of arms to Spain, 7-111.

1940 Italians drove British garrison out of British Somaliland, 7-84.

20 1854 Battle of Alma, Crimea, 2-532.

1897 Sir Ronald Ross discovered malaria parasites in the mosquito *Anopheles*. Malaria, 5-93; Medicine, 5-165; Mosquito, 5-271; Panama Canal, 6-54.

1911 Portugal became a republic, 6-269.

1940 Leon Trotsky, Russian revolutionary, assassinated, 7-319; Russia, 6-476.

21 1808 Wellington defeated the French at Vimeiro, Peninsular War, 6-116; Wellington, 7-437.

1930 Princess Margaret born, 5-124; Elizabeth, Queen Mother, 3-236; George VI, 3-523.

22 1485 Battle of Bosworth Field, 2-23; Roses, Wars of the, 6-454.

1906 First aeroplane flight in Europe made by Santos-Dumont. Aeroplane, 1-38; Airship, 1-83.

1935 Social Credit League won Alberta elections. Alberta, 1-94.

23 1305 Sir William Wallace, Scottish patriot, executed, 7-415; Scotland, 6-512.

1628 George Villiers, Duke of Buckingham, murdered at Portsmouth, 2-103; Charles I, 2-306; English History, 3-278.

1914 Opening of battle of Mons. World Wars, 7-478.

1921 Feisal I crowned King of Iraq, 4-278.

1939 Russo-German non-aggression pact signed, 6-; Hitler, 4-183; World Wars, 7-486.

24 79. Herculaneum and Pompeii destroyed by eruption of Vesuvius, 6-256; Vesuvius, 7-395; Volcanoes, 7-405.

1572 ST. BARTHOLOMEW'S DAY. Massacre of the

AUGUST



August 27 1903 Sir Donald George Bradman, the great Australian batsman, was born at Cootamundra NSW

- Huguenots in Paris, 4-201, 202 Charles IX, 2 309
 France History, 3 370 Henry IV, 4 164
 1686 Calcutta founded by Job Charnock, 2 172 Jute
 4 390.
 1759 William Wilberforce, British philanthropist
 born Slavery, 7 66
 1875 "Captain" Matthew Webb became the first to
 swim the English Channel Swimming, 7 210

- 25** 1770 Thomas Chatterton English poet, com-
 mitted suicide, 2 310
 1825 Uruguay proclaimed independent, 7 371
 anniversary kept as Uruguay's Independence Day
 1919 First London Paris air service started Aero-
 plane, 1 11
 1931 National Government formed in Britain Labour
 Party, 4 427, MacDonald, J R 5 62 United
 Kingdom, 7-352
 1944 Liberation of Paris, 6 55 World War 7 495

- 26** 1346 Edward III defeated the French at
 Crécy, 2-527, Agincourt, 1 68, Black
 Prince, 1-480, Hundred Years War, 4 203
 1676 Sir Robert Walpole, first British Prime Minister
 born, 7-417, United Kingdom, 7 347
 1819 Albert, Prince Consort, born, 1 92, Victoria
 Queen, 7-396.
 1883 Beginning of three days eruptions of Krakatoa
 Volcano, 7-406.
 1936 Anglo-Egyptian Treaty signed. Egypt, 3 178

- 27** 1784 First balloon ascent in Great Britain
 1 354.
 1816 Algiers, stronghold of the Barbary
 pirates, bombarded by Lord Exmouth Algeria,
 1 110, Moors, 5 260, Pirates 6 206
 1903 Sir Donald George Bradman, Australian
 cricketer, born 2 38

- 28** 1749 Johann Wolfgang von Goethe German
 poet, born 4-37 Faust, 3 343 Germany
 Literature 4 13
 1833 Sir Edward Burne-Jones English painter born
 English Art 3 264 Morris William 5 266, Pre-
 Raphaelites 6 285
 1850 First submarine telegraph (Cape Gris Nez to
 Dover) opened Cable 2 152
 1879 Zulu chief Cetshwayo captured by the British
 South Africa, 7 91 Zulus 7 527
 1910 Montenegro proclaimed a kingdom 5 230
 Balkan Peninsula 1 370

- 29** 1632 John Locke English philosopher born
 4 534 Philosophy 6 159 (picture) 160
 1835 City of Melbourne founded 5 167
 1862 Maurice Maeterlinck Belgian poet and drama-
 list born 5 72

- 30** 30 B.C. Cleopatra poisoned herself 2 407
 Mark Antony 5 129
 1797 Mary Wollstonecraft Shelley born
 Shelley 7 26
 1871 Lord Rutherford English physicist born 6 482
 Atom 1 297 Radium 6 351
 1905 Alberta constituted a Canadian province 1 94
 Calgary, 2 175 Canada 2 200 Petroleum 6 130
 (picture)

- 31** 1591 Sir Richard Grenville in the *Le Reuyl*
 engaged the whole Spanish Fleet 4 96
 Azores 1 331
 1870 Maria Montessori Italian educationist born
 5 250 Education 3 166



August 30, 30 B.C. Cleopatra died In the relief from Dendera she is shown (left) making sacrifices to the gods



SEPTEMBER

Nature Notes Winged seeds or "keys" sprilling down from sycamore trees (7 210) and showy berries of rowan or mountain ash (1 263) turning orange-red hint at the coming of autumn. Leafless spikes of wickerbush (7 410) berries are conspicuous at the end of the hedge with Oak apples and maple gills show where small gull flies have been busy in the oak trees (5 480). In wet ground mint (5 222) is flowering and fragrant. In the meadows, mustelids (5 301) are becoming abundant. Partridges (6 95) face the start of the shooting season. The quail (6 316) again fulfils a role which resembles that of partridge but smaller and living for Africa and swallows (7 148) are beginning to assemble in flocks before departing on their autumn migration (5 202). Goats (5 271) have had a long season and still their fate can be partial. The curlew (3 154) harmful to human beings, is the chull of the night and is less eager to leave its haven retired. In the water a big fish quite motionless is almost certainly a pike (6 200) with lock out for those other "coarse" fish such as roach, dace, tench (6 403) in which the minnow (3 382) is interested. The night feeding otter (6 10 and 4 209) is no friend to the fisherman and the latter has little affection for the moorhen (6 353) whose vigorous diving disturbs everything in the water. In and about the farmyard men are busy with flocks (3 458) driving cats and rabbits from their runs and burrows.

1 70 Destruction of Jerusalem by Titus (4 361). Jews (4 375). Palestine (6 45).
1804 Asteroid Juno discovered by Professor Harding (Juno, 4 386).

1870 Battle of Sedan (Franco-Prussian War (3 479). Napoleon III, 5 324).

1913 French aviator Pezoud the first man to loop the loop (Acroplane 1 41).

1923 Tokyo and Yokohama devastated by earthquake (Earthquakes (3 152). Japan, 4 342. Tokyo (7 289). Yokohama (7 514).

1939 Germany invaded Poland (Germany (History (4 11). Poland, 6 241). World Wars, 7 486).

2 31 B.C. Battle of Actium (Augustus (Octavian defeated Antony (Augustus, 1 509). Cleopatra (2 408). Mark Antony, 5 129). Rome (History (6 134).

A.D. 1666 Great Fire of London begun (Fire fighting (3 361). London, 5 20).

1898 Battle of Omdurman (Kitchener, 4 415).

1945 Japanese surrender signed (World Wars (7 498).

3 Oliver Cromwell's victories at Dunbar (1650) and Worcester (1651) and also the date of his death (1658) (Cromwell, 2 533). Oak, 5 489.

1939 Great Britain and France declared war on Germany (Chamberlain, A. N., 2 301). European History, 3 318. United Kingdom (7 352). World Wars (7 486).

1943 Allied landings on the Italian mainland, and surrender of Italy, 4-317. European History, 3 319. World Wars, 7-494.

1944 Liberation of Brussels, 2-101. World Wars, 7 495.

1948 Death of Dr. Eduard Benes, Czech statesman and president (1 428). Czechoslovakia (3 24). Masaryk Jan, 5 143.

4 1871 End of the French Second Empire (France (History (3 453).

1923 German inflation at its height (mark quoted at 77 million to the £) (Germany (History, 4 9). World Wars (7 48).

1936 Largo Caballero formed Socialist ministry in Spain (7 110).

5 1585 Cardinal Richelieu (French ecclesiastic and statesman, born (6 400). France (History (3 430). Louis, Kings of France, 5 41.

1638 Louis XIV of France born (France (History (3 451). France (Literature, 3 455 (picture). Louis, Kings of France, 5 42.

1800 French surrendered Malta to the British after blockade by Nelson's fleet (5 98).

1807 Island of Heligoland seized from the Danes by Great Britain (4 159).

1905 Treaty of Portsmouth (New Hampshire, U.S.A.) concluding Russo-Japanese War (Japan, 4 330). Russia (6 474).

6 1620 The Pilgrim Fathers sailed from Plymouth in the *Mayflower* (6 201). Massachusetts, 5 145. (picture).

1766 John Dalton, British chemist, born (3 29). Atom (1 296 (picture). Chemistry, 2 317.

1914 First Battle of the Marne opened (World Wars, 7 478).

1948 Juliana invested as Queen of the Netherlands (Netherlands, 5-378 (picture).

SEPTEMBER



September 9, 1737. Luigi Galvani born. In this print he demonstrates the effects of electricity on a frog's muscles.

7 1533 Queen Elizabeth I born, 3-230; Armada, 1-240; Henry VIII, 4-164; Mary Queen of Scots, 5-141.

1838 Grace Darling and her father made gallant sea-rescue at the Farne Islands, 3-49.

1940 London "blitz" opened with air raid on the docks, 5-28. Britain, Battle of, 2-78 (picture); United Kingdom, 7-353; World Wars, 7-489.

8 1157 Richard I, King of England, born, 6-398; Crusades, 3-2.

1664 New Amsterdam surrendered by the Dutch to the English, and renamed New York, 5-416.

1886 Johannesburg founded, 4-377; Gold, 4-39; South Africa, 7-91.



September 10, 1753. Sir John Soane born. His house in Lincoln's Inn Fields, London (above), is now a museum.

1944 First rocket bomb of the Second World War fell on London. London, 5-28; World Wars, 7-495.

9 1513 Battle of Flodden Field, 3-389; Scotland, 6-512.

1737 Luigi Galvani, Italian scientist, born, 3-500; Electricity, 3-210.

1828 Count Leo Tolstoy, Russian novelist and reformer, born, 7-289; Novel, 5-472; Russian Literature, 6-480.

1911 First regular air mail service (Hendon-Windsor) started. Air Transport, 1-85.

1926 Germany admitted to the League of Nations, 4-9; League of Nations, 4-464.

10 1753 Sir John Soane, British architect, born. British Museum, 2-88.

1847 Gold discovered in California, 2-178; Gold, 4-39.

1857 Thomas Babington Macaulay raised to the peerage, 5-58.



September 12, 1919. D'Annunzio (standing alone), Italian poet and patriot, seized the Adriatic port of Fiume.

1917 Kerensky became premier of Russia. Russia, 6-474.

1919 Peace treaty with Austria signed at St. Germain; World Wars, 7-484.

11 1524 Pierre de Ronsard, French poet, born. France: Literature, 3-455.

1709 Battle of Malplaquet. Marlborough, 5-132.

1877 Sir James Hopwood Jeans, British scientist, born, 4-358.

1885 David Herbert Lawrence, British novelist and poet, born. English Literature, 3-201; Novel, 5-473.

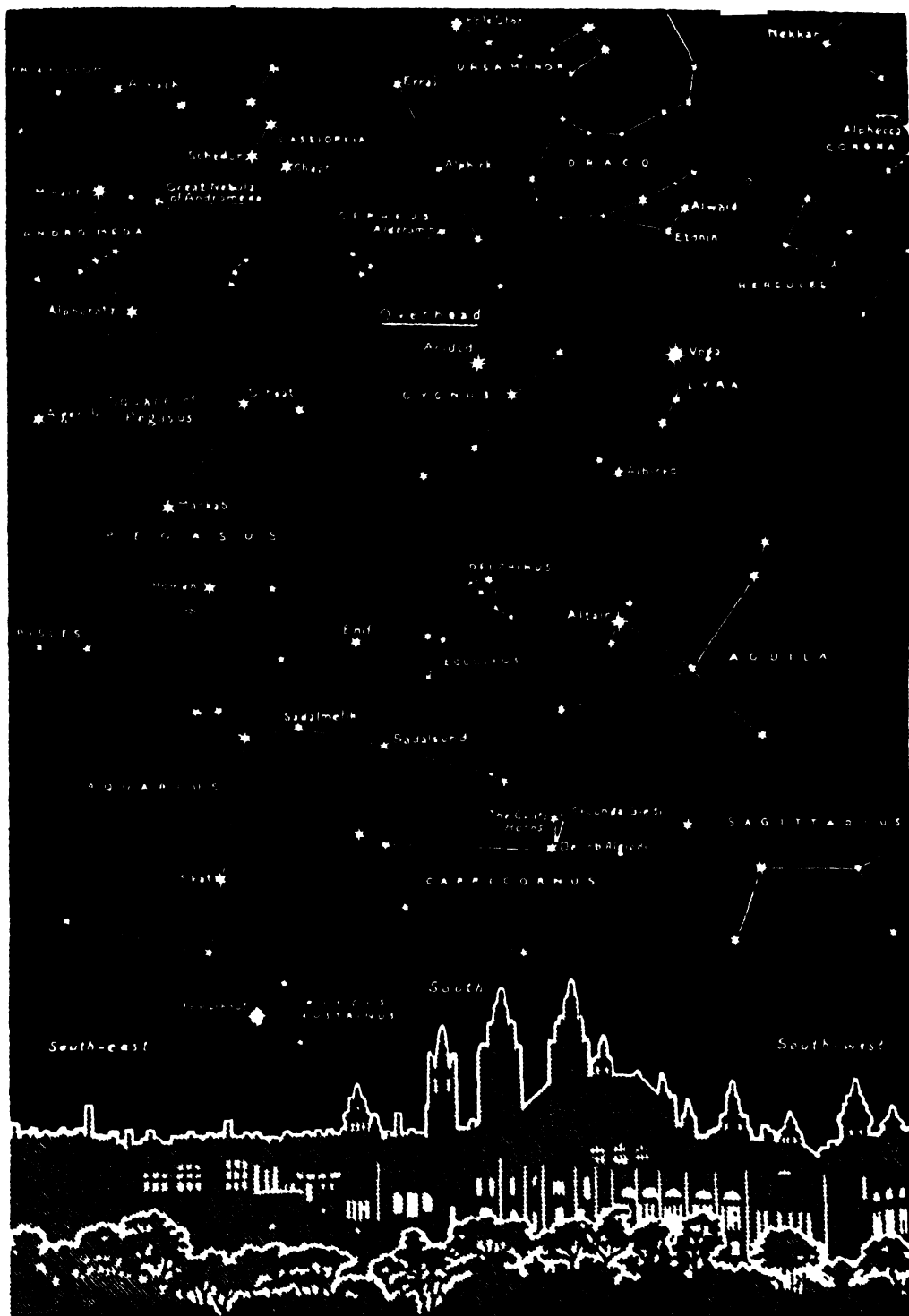
1948 Mahomed Ali Jinnah, first Governor-General of Pakistan, died, 4-376. Pakistan, 6-40.

12 1440 Eton College received its first charter, 3-304; Henry, Kings of England, 4-163.

1919 Gabriele d'Annunzio seized Fiume, 1-159.

1944 Armistice between Allies and Rumania, 6-471; World Wars, 7-496.

SEPTEMBER



THE STARS IN SEPTEMBER With this map you can study the stars from the middle of September to the middle of October. You are looking south in Glasgow, and on the right hand can be seen the Art Gallery. The stars are seen virtually in this position from all parts of Britain at about nine o'clock p.m. in the middle of September.

SEPTEMBER



September 14, 1735 Robert Raikes, founder of Sunday schools born First for girls in Gloucester above

- 13** 1672 John Bunyan released from Norwich jail 2 125
1759 Wolfe stormed the Heights of Abraham and was mortally wounded 7 465 Canada 2 200 Montcalm 5 250 Quebec 6 321
1832 Wolsley's victory at Tel el Kebir Egypt 3 176
1909 Peary exposed falsity of Cook's claim to have reached the North Pole Polar Exploration 6 244
1914 Battle of the Airne begun World Wars 7 478

- 14** 1321 Dante, Italian poet died 3 46 Italy Literature 4 329
1735 Robert Raikes British philanthropist founder of Sunday schools born Club 2 425 School 6 504
1814 F S Key wrote The Star Spangled Banner Maryland 5 143 National Anthems 5 326
1897 Hawaiian senate ratified treaty of annexation with USA Hawaiian Islands 4 140 United States History 7 362

- 15** 1812 Russians set fire to Moscow (night of 15-16) to stop French occupation 5 270 Napoleon I 5 322
1830 Liverpool Manchester railway opened William

- Huskisson, M P run over and killed Railways 6 354
1833 Arthur Henry Hallam, subject of Tennyson's In Memoriam, died 7 257 English Literature 3 290 Poetry 6 235
1916 First use of tanks in warfare (by British, on the Somme) Tanks 7 223 World Wars 7 479, 481

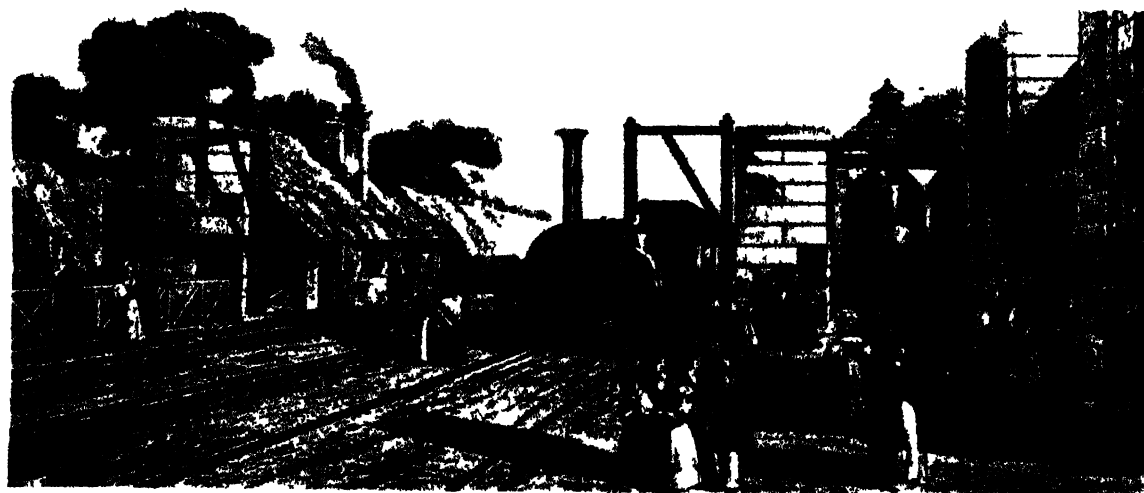
- 16** 1795 British took Cape Town 2 217 British Commonwealth 2 84 South Africa 7 90
1859 Lake Nyasa discovered by Livingstone 4 527
1934 Soviet Union became member of the League of Nations 4 464

- 17** 1939 Russia invaded Poland 6 241
1944 1st British Airborne Division landed at Arnhem 1 254 World Wars 7 495
1948 count Folke Bernadotte United Nations observer, murdered by Jews Israel 4 303

- 18** 53 Trajan, Roman Emperor born Rome History 6 439
1810 Chile revolted against the Spaniards 2 360 South America 7 98
1900 Commonwealth of Australia proclaimed 1 318 British Commonwealth 2 83
1914 Irish Home Rule bill received royal assent Irish Republic 4 284 United Kingdom 7 352
1949 Devolution of the UK Cold Standard 4 43

- 19** 1356 Battle of Poitiers Azincourt 1 68 Black Prince 1 480 Hundred Year War 4 204
1840 Auckland New Zealand founded 1 307
1905 Dr F J Burnardo founder of homes for children died 1 370

- 20** 451 Aetius, Roman general defeated Attila's Huns at Châlons sur Marne Attila 1 306
1792 French defeated Prussians at Valmy French Revolution 3 469
1857 British recaptured Delhi from Indian mutineers 3 68 India History 4 253
1909 South African Union bill received royal assent 7 92 British Commonwealth 2 84
1913 Gusty Hamel won Daily Mail Aerial Derby (92½ miles) Aeroplane 1 44



September 15, 1830 Liverpool Manchester railway opened The illustration shows an engine taking in water at Parkside Station, where William Huskisson M P for Liverpool, was killed by an engine on the day the railway was opened

SEPTEMBER



September 24, 1951 Estate at Harlow new town, in Essex, opened. An arcade in the shopping centre is here seen

21 1984 Roman poet Virgil died 7 402 Latin Literature 4 140
1327 Edward II murdered in Berkeley Castle Edward Kings of England 3 167
1756 John Louden MacAdam roadmaker, born 5 57 Roads, 6 407
1866 H. G. Wells English novelist and historian born 7 438 English Literature 3 291 Novel 5 473

22 1586 Battle of Zutphen Sir Philip Sidney mortally wounded 7 51
1721 Thomas Doggett donor of Thames watermen's coat and badge died Rowing 6 459
1791 Michael Faraday British physicist born 3 340 Dynamo 3 442 Electricity, 3 210 215
1792 French revolutionary calendar came into a French Revolution 3 469
1827 Joseph Smith announced discovery of the Book of Mormon Mormon 5 263
1927 Gene Tunney beat Jack Dempsey for world heavyweight boxing title Boxing 2 30

23 480 c. Euripides Greek dramatist born 3 307 Drama 3 116 Greek Language and Literature 4 93
1645 Montrose defeated at Philiphaugh 5 236
1779 Naval battle between Paul Jones and the *Scraper* 4 381
1846 The planet Neptune discovered 5 367 Astronomy 1 275 (picture) 282 Planets 6 213 Uranus 7 370
1940 George Cross and Medal instituted by King George VI Malta 5 98 99 (picture) Orders and Decorations 5 530

24 1717 Horace Walpole 4th Earl of Orford English writer born 7 416
1951 Industrial estate at Harlow new town opened Architecture 1 219 Town Planning 7 303

25 1066 King Harold II of England defeated the Norwegians under Harold Hardrada at Stamford Bridge Harold Kings of England, 4-133
1513 Vasco Nuñez de Balboa discovered the Pacific Ocean, 1 348 America, 1 133 Pacific Ocean, 6 29
1857 Lucknow relieved by Havelock India History 4 253
1943 Russians recaptured Smolensk World Wars 7-493.

26 1750 Lord Collingwood, British admiral, born, 2 454, Trafalgar, 7 304
1907 New Zealand granted Dominion status, day kept as New Zealand Dominion Day 5 426
1934 Cunard liner *ss Queen Mary* launched by Queen Mary Ships, 7 32

27 1540 The Pope confirmed the rules of the Society of Jesus Loyola 5 46
1835 Stockton-Darlington line, world's first steam railway opened Railways, 6 354
1905 Anglo-Japanese treaty of alliance signed Japan 4 330

28 490 c. Battle of Marathon Persians defeated by Greeks Persia 6 130
1685 Judge Jeffreys appointed lord chancellor 4 359
1745 God Save the King sung for the first time (at Covent Garden) National Anthems, 5 325

29 1634 Milton's masque *Comus*, presented at Ludlow Castle 5 209
1725 Robert Lord Clive British soldier and statesman born 2 411 Calcutta 2 173 Hastings Warren 4 136 India History 4 232
1911 Italy declared war on Turkey over Tripoli 4 316 Libya 4 489 Turkey, 7 335

30 1832 Lord Roberts born 6 414 Afghanistan 1 47 Boer War 1 502
1856 William Willett promoter of daylight saving born Daylight Saving 3 5
1926 Discovery of penicillin first announced Anti-Biotic 1 174 Fleming Sir Alexander 3 388
1929 John L. Baird started television transmissions from BBC studios Television 7 254
1938 Munich Agreement on Czechoslovakia signed, 5 296 Chamberlain A. N. 2 300 Czechoslovakia 3 24 Hitler 4 183 World Wars 7 486



September 22, 1721 Thomas Doggett donor of Thames watermen's coat and badge died Above are the starters in the annual rowing race for the trophy held in August



OCTOBER

Nature Notes A thinner, bare landscape is the impression now that leaves (4-172) are falling from the deciduous trees (7-308). Its thick coils about a sturdy trunk, the evergreen ivy (4-332) displays bunches of yellowish green flowers. Quaker patches of variously coloured and squat plant life called hehens (4-490) repay close inspection. A fairy ring (3-339) shows up on an expanse of short turf as with ferns (3-316), these fungi multiply by means of spores (6-530). Bird visitors arriving for the winter include the woodcock (7-467). Swans (7-198) with their young ones, called cygnets, swim placidly about on still, quiet waters. The month bodes ill for the pheasant (6-153), the close season for which has ended. Standing motionless in a shallow stream is a heron (4-170), until suddenly it stabs with lightning motion at a fish, or frog or water-vole, or eel. A wonderful story lies behind the migration of older eels (3-170) to the sea at breeding time, from pond, ditch, lake, or river they travel by night, overland if necessary. Supping daintily at the juice of a bruised apple or other spoiled fruit is a gorgeous red admiral butterfly (2-138). Attached to tree-trunk or palings, pupae or chrysalids (2-130) of various butterflies and moths can be found, other pupae lie buried in the top soil at the foot of trees. A group of insects called winter moths (7-161) engage in egg-laying activities which cause fruit growers and others considerable trouble and expense.

- 1** 1684 Pierre Corneille, French dramatist, died, France, Language and Literature, 3-455.
- 1800 Spain ceded Louisiana to France, 5-44.
- United States, History, 7-361.
- 1860 Garibaldi defeated the Neapolitans at the river Volturno, 3-504.
- Italy, History, 4-316.
- 1892 Chicago University opened to students, 2-334.
- 1918 Alan Cobham completed 28,000-mile return flight to and from Australia. Aeroplane, 1-42.
- 2** 1453 Richard III of England born, Bosworth Field, 2-23.
- Henry VII, 4-163.
- Richard, Kings of England, 6-399.
- Roses, Wars of the, 6-454.
- 1535 Jacques Cartier named the site of future Montreal, 5-276.
- 1852 Sir William Ramsay, British chemist, born, 6-363.
- Neon, 5-366.
- 1885 Italo-Abyssinian war began. Abyssinia, 1-7.
- European History, 3-317.
- Italy, 4-317.
- Mussolini, 5-311.
- World Wars, 7-485.
- 3** 1223 St. Francis of Assisi died, 3-456.
- 1263 Scots defeated Norwegians at the Battle of Largs. Thistle, 7-270.
- 1844 Sir Patrick Manson, British physician, born, Medicine, 5-165.
- 1944 R.A.F. bombers breached dyke at Walcheren, Netherlands, 5-390.
- 4** 1594 Sir Martin Frobisher, Elizabethan sailor, died, 3-471.
- 1795 S. F. Coleridge, English poet, married, 2-448.
- English Literature, 3-288.
- Poetry, 6-234.
- 1830 Belgians proclaimed independence and rebelled 1-417.
- European History, 3-315.
- 1910 Portugal deposed Manoel II and became a republic, 6-269.
- 1918 Tsar Ferdinand of Bulgaria abdicated. Bulgaria, 2-120.
- 5** 1535 First English printed Bible (Miles Coverdale's version) issued. Bible, 1-443.
- 1908 Bulgaria's independence day, 2-120.
- 1925 Opening of Locarno Conference. European History, 3-317.
- Chamberlain, Sir Austen, 2-300.
- 1930 British dirigible R 101 wrecked near Beauvais. Airship, 1-84.
- 6** 1536 William Tyndale strangled as a heretic, 7-339.
- Bible, 1-441 (picture), 442.
- 1769 Captain Cook discovered New Zealand. Cook, 2-495.
- New Zealand, 5-425.
- 1846 George Westinghouse, American inventor, born, Brakes, 2-42.
- Locomotive, 5-4.
- 1887 Le Corbusier, Swiss architect, born, 4-473.
- Architecture, 1-219.
- 7** 1571 Battle of Lepanto. Navy, 5-353 (picture).
- Turkey, History, 7-335.
- 1870 Leon Gambetta escaped from Paris in a balloon. Balloon, 1-356.
- Franco-Prussian War, 3-459.
- 1885 Niels Henrik David Bohr, Danish physicist, born. Atom, 1-297 (picture).
- Electron, 3-221.
- 8** 1085 Final consecration of St Mark's, Venice, 7-387.
- 1831 Opening of King's College, London. London, University of, 5-33.
- 1871 Outbreak of great fire at Chicago, 2-334.
- 1885 Bechuanaland proclaimed British territory. Boer War, 1-502.
- South Africa, 7-89.

OCTOBER

1912 Montenegro first of the Balkan League to declare war on Turkey Balkan Peninsula 1 350
Bulgaria 2 121, Greece 4 78, Montenegro 5 250
Serbia 6 532 Turkey 7 335

9 1201 Robert de Sorbonne founder of the college of that name in Paris born Paris 6 84, University 7 368

1547 Miguel de Cervantes Saavedra Spanish author baptised 2 294, Spanish Literature 7 121

1701 Yale College (later University) received its charter Connecticut 2 486 University 7 368

1779 First Luddite riots against the introduction of machinery Ludd 4 432

1934 Alexander I of Yugoslavia assassinated at Marseilles Yugoslavia 7 520

10 732 Saracens defeated by Franks at battle of Tours Charles Martel 2 309 Mahomet 5 80

1684 Jean Antoine Watteau French painter born France Art 3 439 440 (picture) Painting 6 34

1731 Henry Cavendish English scientist born 2 283 Chemistry 2 317

1861 Endre J. Nansen born 5 316 Polar Exploration 6 242

1877 Lord Nuffield born 5 473

1911 Outbreak of public revolution in China 2 375

1914 Fall of Antwerp to the Germans 1 178 World War 7 478

11 1399 Order of the Bath formally constituted Orders and Decorations 5 380

1521 Title Defender of the Faith conferred on Henry VIII by Pope Leo X Henry Kings of England 4 164 (picture)

1889 J. P. Joule British physicist died 4 384 Heat 4 116

1899 Boer War began 1 502 South Africa 7 92



October 11 1899 Boer War began British troops are here seen charging Boer positions on Spion Kop

12 1492 Columbus discovered the Bahamas anniversary kept in USA as Columbus Day America Discovery 1 132 Bahamas 1 347

1537 Edward VI King of England born 3 167 168 (picture) Church of England 2 386 Henry Kings of England 4 164 School 6 303

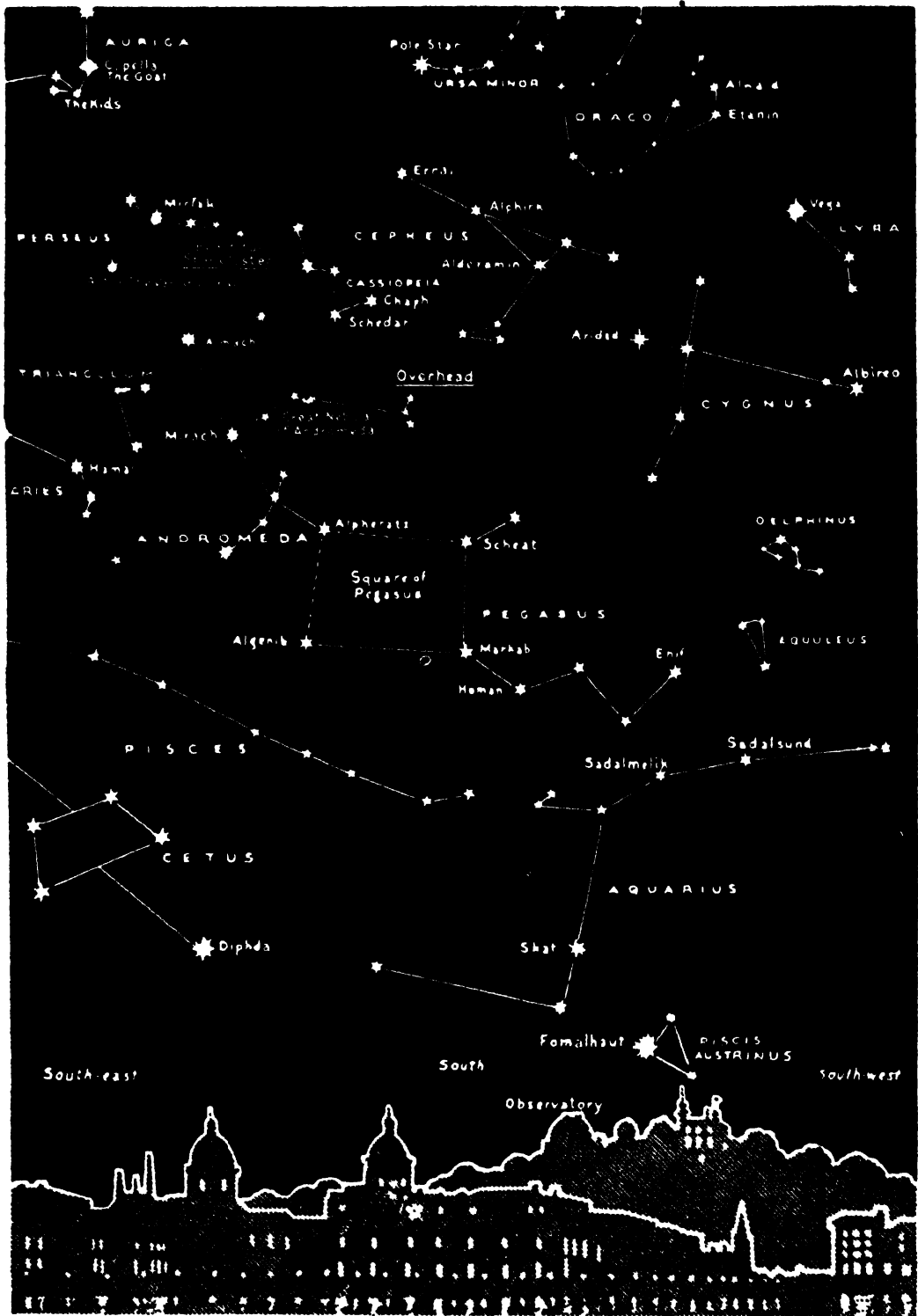
1943 Portugal granted wartime air base in the Azores to Britain Azores 1 330 Portugal 6 270

13 54 Roman Emperor Claudius I poisoned by his wife Agrippina Rome History 6 437 Britain 2 73 English History 3 270 Nero 5 367



October 9, 1201 Robert de Sorbonne founder of the University of Paris, born The Sorbonne was founded in 1252 as a hostel for poor students, and won great fame The present buildings date only from the 19th century

OCTOBER



THE STARS IN OCTOBER. With this map you can study the stars from the middle of October to the middle of November. You are looking across the river Thames towards Greenwich, and you are close to the meridian line marked O on maps. The building containing the telescope that marks the meridian is next to the Observatory dome.

OCTOBER

1601 Tycho Brahe Danish astronomer, died, 2 38
Constellation, 2 491 Kepler, 4 401
1944 Liberation of Athens 1 288

14 1066 Battle of Hastings, 4 136, Harold
Kings of England 4 133, William I
Kings of England, 7 451
1633 James II born James Kings of Great Britain
4 339, English History 3 280 Jacobites 4 331

15 1608 Evangelista Torricelli Italian physi-
cist inventor of barometer born Baro-
meter 1 370
1783 Pilatre de Rozier the first man to make
a balloon ascent Balloon 1 353
1856 Oscar Wilde author and dramatist born
English Literature 3 291
1946 Hermann Goerring German politician and war
leader committed suicide Nuremberg 5 476

16 1555 Nicholas Ridley and Hugh Latimer
bishops burned at the stake Latimer
4 448 Martyrs 5 139
1758 Noah Webster American lexicographer born
Dictionary 3 88
1793 Marie Antoinette Queen of France guillotined
in Paris 5 123 French Revolution 3 467 468
Louis Kings of France 5 13
1859 John Brown U.S. anti-slavery computer
ruined the arsenal at Harper's Ferry 2 93
1869 Girton College for women founded in a Hitchin
(Herts) house Cambridge 2 182
1946 Execution of the ten major German war
criminals at Nuremberg 5 476

17 1346 Scots defeated by English at Neville's
Cross Durham 3 110
1777 Battle of Saratoga British defeated
by Americans American Independence 1 139
1851 First message sent by submarine telegraph
Cable 2 152

1854 Siege of Sebastopol opened Crimea 2 532
Balachova, 1 348

18 1685 Revocation of the Edict of Nantes
massacre of Huguenots 4 202
1865 Death of Lord Palmerston 6 of
United Kingdom, 7 350
1867 Alaska bought from Russia by the United
States formally taken over, 1 88 90 United
States 7 356 357 362

19 1605 Sir Thomas Browne English phys-
ician and writer born (and died in 1682)
English Literature 3 286
1813 End of Battle of Leipzig allies defeated
Napoleon 5 323 Leipzig 4 476
1845 Wagner's opera *Tannhauser* first played, at
Dresden 7 408 Opera 5 520
1922 Conservative Carlton Club meeting put an end
to Lloyd George's coalition Lloyd George 4 532
United Kingdom 7 352

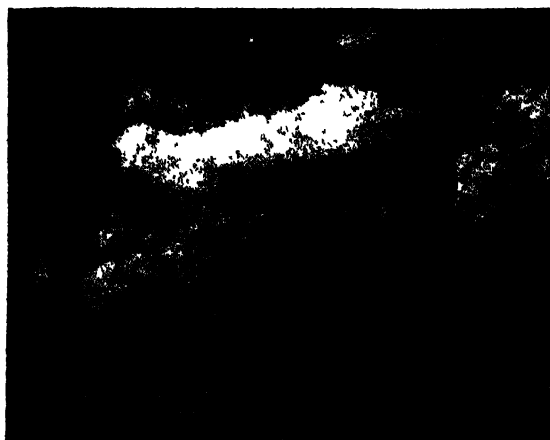
20 1632 Sir Christopher Wren English archi-
tect born 7 300 Architecture 1 217
London 5 20 21 (picture) St Paul's
6 487
1822 Thomas Hughes British author born Children's
Books 2 336
1827 British French and Prussian fleets annihilated
Turkish fleet at Navarino Greece, 4 78
1944 U.S. forces landed in Iwo Jima Philippine Island
6 157 Japan 4 300 World Wars 7 498

21 1805 Battle of Trafalgar and death of
Nelson 7 304 Collingwood 2 434
Napoleon I 5 320 Nelson 5 363 Pitt
6 208 United Kingdom 7 348
1833 Alfred Nobel Swedish scientist born Nobel
Prizes 5 443
1854 Florence Nightingale embarked for the Crimea
5 437 Crimea 2 532 Nursing 5 485



October 20, 1827 Battle of Navarino, Greece, in which a Turkish and Egyptian fleet was destroyed by the British and their
Allies It was the decisive battle in the Greek War of Liberation Navarino is now called Pylos

OCTOBER



October 23, 1942. Battle of Alamein began. Above, crew of a disabled German tank surrender to British infantry.

22 1707 Admiral Sir Cloudealey Shovell wrecked and drowned on Scilly Isles reef. Scilly Isles, 6-509.
1811 Franz Liszt, Hungarian composer and pianist, born, 4-522.
1946 Two British destroyers mined off the coast of Albania, 1-92.

23 1844 Robert Bridges, former poet laureate born. English Literature, 3-291; Poet Laureate, 6-232.
1942 Battle of Alamein opened, 1-88; Montgomery, 5-255; World Wars, 7-492.
1944 Russians invaded East Prussia. World Wars, 7-496.

24 1648 Thirty Years' War ended by Peace of Westphalia, 7-269. European History, 3-314; Germany: History, 4-8.
1917 Beginning of Italian rout at Caporetto. World Wars, 7-481.
1950 Berlin's Freedom Bell first rung. Bells and Bell-ringing, 1-425, 427.

25 1415 Battle of Agincourt, 1-68; Henry, Kings of England, 4-165; Hundred Years' War, 4-204.
1764 William Hogarth, English painter and engraver, died, 4-184; English Art, 3-259, 265 (picture).
1854 Battle of Balaklava; Charge of the Light Brigade, 1-348; Crimea, 2-532.
1935 End of first National Government in Britain MacDonald, J. R., 5-62; United Kingdom, 7-352.

26 1759 Georges Jacques Danton, French revolutionist, born, 3-47; French Revolution, 3-469; Marat, Jean Paul, 5-120; Robespierre, 6-415.
1825 Erie Canal completed. Great Lakes, 4-69.
1918 General Allenby took Aleppo, Syria, 1-112. World Wars, 7-483.

27 901 Alfred the Great died, 1-103.
1553 Servetus burned at Geneva for heresy at Calvin's behest. Calvin, 2-179.
1811 Isaac Merritt Singer, responsible for important improvements in the sewing machine, born. Sewing Machine, 7-10.

28 1636 Harvard University founded. Boston (Mass.), 2-22; Universities, 7-308.
1748 Lima and Callao demolished by an earthquake. Lima, 4-508.
1918 Czechoslovakia proclaimed a republic, 3-21; anniversary kept as Czechoslovakia's Independence Day. Masaryk, T. G., 5-143; World Wars, 7-483.
1940 Greece invaded by Italian forces, 4-78. World Wars, 7-489.

29 1618 Sir Walter Raleigh, English soldier and writer, beheaded, 6-362. America, 1-135; Carolina, 2-245; Orinoco, 6-3.
1740 James Boswell, Scottish author, born, 2-22; Johnson, Samuel, 4-380.
1795 John Keats, British poet, born, 4-394; English Literature, 3-279; Poetry, 6-235.
1889 British South Africa Company received its charter. Rhodes, Cecil, 6-393; South Africa, 7-91.
1923 Turkey became a republic, 7-336; anniversary kept as her National Day; Kemal Ataturk, 4-397.

30 1485 The Yeomen of the Guard (Beefeaters) instituted by Henry VII; Beefeater, 1-410, facing 396 (picture).
1751 Richard Brinsley Sheridan, British dramatist, born, 7-26; Drama, 3-121; English Literature, 3-288.
1822 Caledonian Canal opened. British Isles, 2-86; Canal, 2-207; Inverness-shire, 4-275.
1922 Fascist march on Rome. Fascism, 3-342; Italy: History, 4-317; Mussolini, 5-311; World Wars, 7-484.

31 HALLOWE'EN (or DUCK-APPLE NIGHT, or BOB-APPLE NIGHT), 4-119.
1620 John Evelyn, English diarist, born, 3-319; English Literature, 3-287; Gibbons, Grinling, 4-19.
1632 Jan Vermeer, Dutch painter, born, 7-391; Netherlands: Art, 5-384, 385 (picture); Painting, 6-35 (picture).
1816 Philo Remington, U.S. typewriter manufacturer, born. Typewriter, 7-341-2.
1915 Steel helmets first issued to British troops on Western front. Armour, 1-244.
1946 Details of electronic calculator ENIAC released. Calculating Machines, 2-170.



October 30, 1922 Fascists marched on Rome. Mussolini, (front left) with his henchmen, went by train.



NOVEMBER

Nature Notes Many extra things one can notice about trees when their foliage has gone (7 314). Much more evident now are the round catkins, hard little seed balls, dangling from the plums (6 211). The beech trees (7 facing 317) keep their burnished copper foliage long after it is scarce and dead, until in fact the new leaves push the old ones off in spring. Lowlier plant life is represented by the mosses (5 272) many now carving their curious fruit. The handsome and wary jay (4 357) unbeloved by gamekeepers is not often seen away from trees and at no time is it easily approached. The snipe (7 75) is noted for its erratic zigzag flight over the marshes. Other common waders are curlew, redshank and sandpiper (7 408). In flocks on cattle feed and marshes, lapwings or green plovers (6 206) keep up their mournful cry, peewit. The nuthatch (5-486) hummers persistently at a hedgecut it has wedged in the fork of a tree until the kernel is exposed for eating. Hard weather drives the gulls (4 107) inland after worms and other food now more easily come by than beside the sea. Appetite at times thins (7 285) a piece of fat hung from a tree branch will be the rallying point of several highly amusing acrobatic flocks they manoeuvre for a peck. Many-legged centipedes (2 201) at what very small ground insects chase snails their way in this cold weather and the knowledgeable cultivator favours them. But no good word can be said for the cockroach (2 483) or the tick beetle which emerges at night to eat and spoil in kitchen and pantry any food left uncovered or unprotected.

- 1** FOXHUNTING SEASON BEGINS Fox, 3-427
- 1500** Benvenuto Cellini, Florentine sculptor and goldsmith, born Italy Art 4 320-328 (picture), Renaissance, 6 396
- 1517** Luther nailed his 95 Theses to the church door at Wittenberg, 5-53, Reformation 6 376
- 1755** Earthquake in Lisbon destroyed the city Earthquakes 3 153, Lisbon, 4-521
- 1914** Naval Battle of Coronel World Wars, 7 450
- 1936** British television service inaugurated, 7 254
- 1944** The Home Guard, British citizen army of the Second World War stood down 4 188 World Wars, 7-488

- 2** **1893** Bulawayo, then Zulu headquarter village, captured by British Rhodesia, 6 395
- 1909** W. P. Frith, British painter died English Art 3 263 (picture) 264
- 1917** The Balfour Declaration on Zionism Israel 4 302 Palestine, 6 46

- 3** **1534** Act of Supremacy, making the King the head of the English Church Church of England 2-386, Henry, Kings of England, 4-164
- 1640** Long Parliament began its sittings Charles British Kings, 2-307 English History, 3-278

- 4** **1590** Gerard van Honthorst, Dutch painter born Buckingham, Duke of, 2 103 (picture)
- 1740** Augustus Toplady author of 'Rock of Ages' born Hymns 4 226
- 1843** Nelson column Trafalgar Square, London completed London, 5 31 (colour plate), Photography 6-173 (picture)

- 5** **1605** Gunpowder Plot GUY FAWKES DAY, 3 343 Fireworks 3 364 James, Kings of Great Britain 4 389
- 1688** William of Orange (later King William III of England) landed at Puxham 7 452-53 English History 3 280, 291
- 1854** Battle of Inkerman Crimea, 2 532
- 1914** Cyprus annexed by Britain Cyprus, 3 21

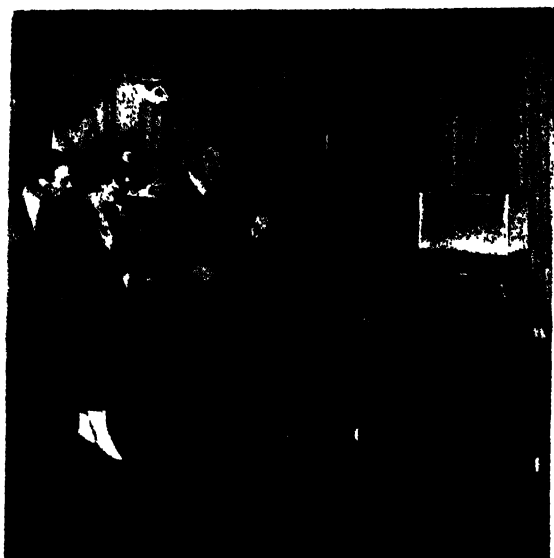
- 6** **1753** Quorn Hunt founded Fox and Fox hunting 3 427-8
- 1932** Nazis biggest party in German general election Germany History 4 10

- 7** **1885** Completion of Canadian Pacific Railway Canada, 2 202 Railways 6 358 (picture) 359
- 1917** (Oct. 25) Old Style Lenin and the Bolsheviks seized power in Russia (the 'October Revolution') Calendar 2 175 Communism 2 474 Lenin 4 479 Russia 6 476 World Wars 7 482

- 8** **68 B.C.** Cicero revealed Catiline's conspiracy in the Senate 2 387-388 (picture)
- 1603** Formal opening of the Bodleian Library Library, 4 487 Oxford 6 20
- 1866** Herbert Austin 1st Baron Austin motor manufacturer, born, 1 311
- 1942** Allied landings in north west Africa Algeria 1 111 Tunisia 7 325 World Wars 7 493

- 9** **LORD MAYOR'S SHOW DAY (LONDON)** The show is held on the Monday if Nov. 9 falls on Saturday or Sunday. On this day Richard Whittington started his third term as Lord Mayor, 7-449

NOVEMBER



Nov. 14, 1922. Members of a revue company take part in one of the early programmes of the British Broadcasting Company

1907 Cullinan diamond presented to Edward VII on his 66th birthday. Crown Jewels, 2 536; Diamond, 3-82 (picture), 85.

1918 William II, German Emperor, abdicated, 7 451; Germany: History, 4 9; World Wars, 7-483.

1918 Polish independence proclaimed. Poland, 6 240; World Wars, 7-483.

10 1667 Racine's *Andromaque* first played, 6 334.

1759 Friedrich Schiller, German poet and dramatist, born, 6-502; Germany: Literature, 4-13; Goethe, 4-38.

1871 Stanley found Livingstone at Ujiji. Livingstone, 4-527; Stanley, 7-145.

1880 Jacob Epstein, British sculptor, born, 3 294. Sculpture, 6-523 (picture), 524.

11 1918 Signing of armistice which ended hostilities in First World War. British dead of both World Wars now commemorated on nearest Sunday, called REMEMBRANCE DAY, 6-383; World Wars, 7 483.

1822 Feodor Mikhailovich Dostoevsky, Russian novelist, born, 3-108; Novel, 5-472; Russian Literature, 6-480.

1887 First digging for Manchester Ship Canal. Canal, 2 207; Manchester, 5 111.

12 1842 Lord Rayleigh, British physicist, born Neon, 5-306; Quantum Theory, 6 318.

1847 Sir James Young Simpson first used chloroform in surgery. Anaesthetics, 1-143; Medicine, 5-165.

1927 First London automatic telephone exchange opened. Telephones, 7 245.

1940 British naval and air victory over Italians at Taranto. World Wars, 7 400.

13 354 St. Augustine, Bishop of Hippo, born, 1 308.

1831 James Clerk Maxwell, British physicist, born, 5-149.

1850 Robert Louis Stevenson, Scottish author, born, 7 156. English Literature, 3 291; Samoa, 6 494.

1920 Hungary ratified Treaty of Trianon, 4 207.

14 1840 Claude Monet, French painter, born, France: Art, 3-440; Impressionism, 4 237.

1840 Auguste Rodin, French sculptor, born, 6-425; Sculpture, 6 524.

1922 British Broadcasting Company sent out its first programmes. Radio, 6-346.

1940 Coventry severely bombed by German aircraft, 2 522; World Wars, 7-489 (picture).

1948 Prince Charles, Duke of Cornwall, born, Elizabeth II, 3 234.

15 1708 William Pitt, Earl of Chatham, British statesman, born, 2 309; American Independence, 1 138; Pitt, William, 6-208; United Kingdom, 7 317.

1731 William Cowper, English poet, born, 2 522. English Literature, 3 288.

1889 Revolution in Brazil overthrew monarchy and established a republic. Anniversary kept as Brazil's national day, 2 49.

1920 First Assembly of League of Nations met, 4 463.

16 1632 Battle of Lutzen and death of Gustavus Adolphus, Sweden, 7 203; Thirty Years War, 7-270.

1811 John Bright, British statesman, born, 2 69. Cobden, 2 435.

1918 Hungary proclaimed a republic, 4 207. European History, 3 316; World Wars, 7 483, 484.

17 1755 Louis XVIII, King of France, born Louis, Kings of France, 5 13. France: History, 3 453.

1800 First meeting of U.S. Congress in Washington 7 121.

1887 F.M. Lord Montgomery, British soldier, born, 5 232. Alamein, 1 87; Normandy Invasion, 5 450. World Wars, 7-492, 494, 496.

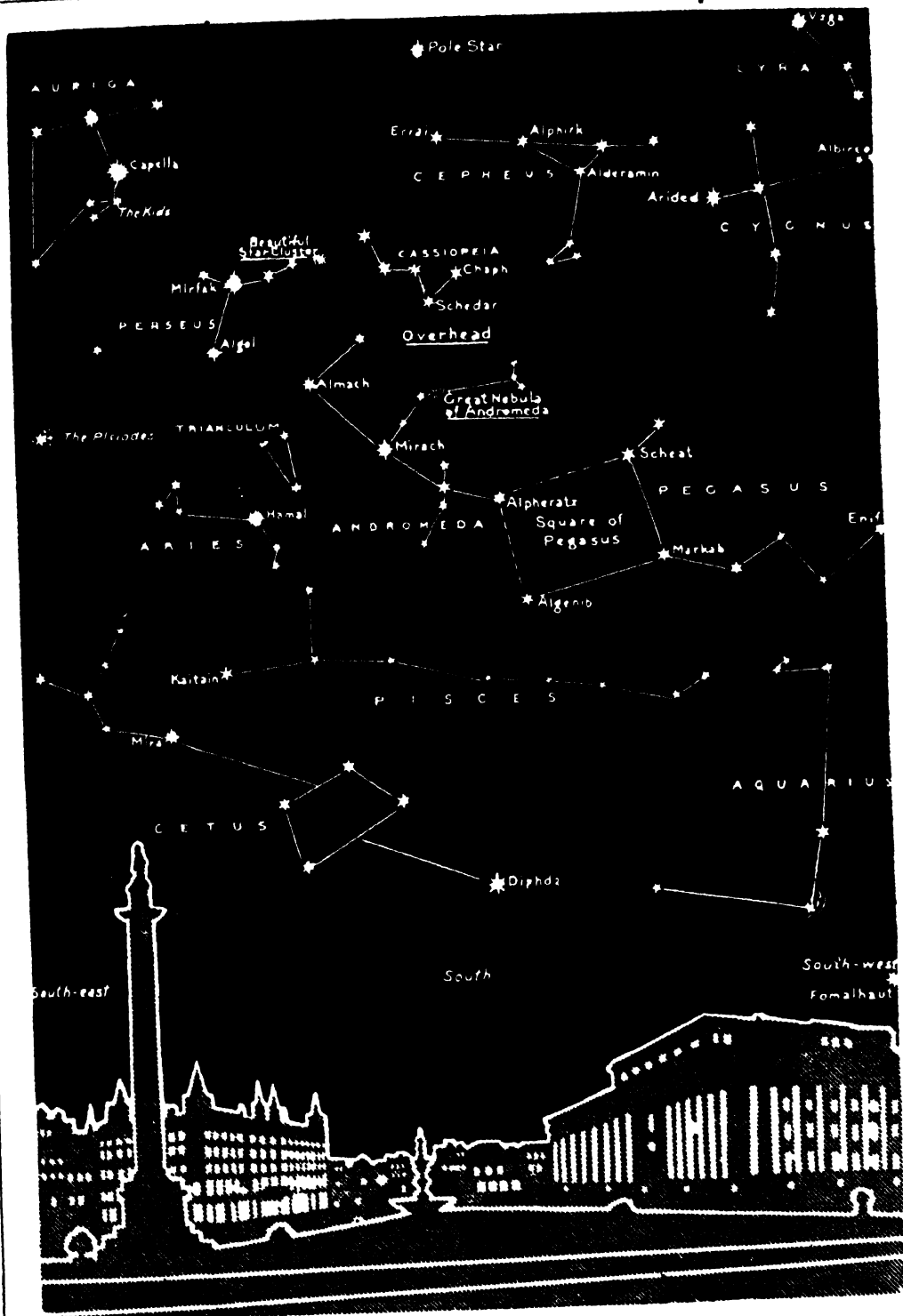
18 1477 Caxton issued his first dated printed book, 2 284; Printing, 6 289.

1626 Consecration of St. Peter's, Rome Rome, 6 127, 128 (picture); Vatican, 7 382, 383 (picture).

Here endeth the booke named the dietes or sayenges of the philosophes interpreted, by me William Caxton at Westmestre the pety of our lordy M^{CC}CCC^{CC} Lxxviii. Whiche booke is late translated out of frensch into englyssh. by the Noble andy puissant lordy Lordy Antone Erle of Ryperes lordy of Salles & of the Isle of Wight, Defendour andy directeur of the siege apoy, Colique for our holy fauer the Q^{ue}n in this Reame of Englonde, andy Echeunour of my lordy Prynce of Wales Andy It is so that at such tyme as he hady accomplysshid this saydy bescheit liberty him to sende it to me in certayn quapens to surceise, Whiche forthwith I fawle & fowle & fowle many gate, notable, and wyfe sayengis of the philosophes Accordynge Into the bookes made in frensch Whiche I hady ofte afore wedy, But certaynly I had fowle none in englyssh

Nov. 18, 1477 Part of Caxton's epilogue to the *Dietes and Sayenges of the Philosophers*, printed at Westminster.

NOVEMBER



THE STARS IN NOVEMBER With this map you can study the stars from the middle of November to the middle of December. You are looking south in Lime Street, Liverpool, and on the right hand is St George's Hall. Many stars in last month's diagram will be seen in the west and south-west, and the Milky Way passes almost overhead.

NOVEMBER



Nov. 19, 1947 Lieut Philip Mountbatten was created H R H the Duke of Edinburgh (above, left) on the eve of his marriage to the present Queen Elizabeth II

1785 Sir David Wilkie, Scottish painter, born. Knox, John, 4-424 (picture)

1789 Louis Jacques Daguerre, pioneer of photography, born. Photography, 6-170.

1922 Marcel Proust, French novelist, died. France Literature, 3-456; Novel, 5-473

19 1703 "The Man in the Iron Mask" died Iron Mask, Man in the, 4-296.
1849 Sir Ambrose Fleming, British scientist, born. Radio, 6-346.

1919 U.S. senate rejected the Peace Treaty. United States: History, 7-362; Wilson, 7-456. World Wars, 7-483.

1946 First general conference of U.N.E.S.C.O. opened in Paris. United Nations, 7-354, 355.

1947 Prince Philip created Duke of Edinburgh, 6-155.

20 1453 Constantinople taken by the Turks. Istanbul, 4-304. Byzantine Empire, 2-149; Turkey, 7-334.

1759 Battle of Quiberon Bay. Seven Years' War, 7-2, 4.

1847 Rev. H. F. Lyte, English divine, author of "Abide with Me," died. Hymns, 4-226.

1951 Snowdonia made a national park, 7-77, 78 (map), Wales, 7-412.

21 1694 Voltaire (François Marie Arouet), French writer, born, 7-406. France: Literature, 3-455. French Revolution, 3-406.

1787 Samuel Cunard, British shipowner, born. Ships, 7-29

1877 Edison announced invention of first practical phonograph, 3-164. Gramophone, 4-56.

1940 Italian retreat in Greece (Greece: History, 4-78. World Wars, 7-489)

22 SAINT CECILIA'S DAY (patron saint of music)
1428 Richard Neville, Earl of Warwick (the "Kingmaker"), born Edward, Kings of England, 3-167; Roses, Wars of the, 6-451

1916 Jack London, American novelist, died. United States Literature, 7-365

23 1770 Molière's comedy, *Le Bourgeois Gentil homme*, first played, 5-232.

1890 Queen Wilhelmina became Queen of the Netherlands Netherlands, 5-380



Nov. 24, 1859. Charles Darwin, celebrated scientist, lived for many years at Downe House, Kent (above), and it was there that he wrote his *Origin of Species*. In 1929 Downe House was presented to the British Association as a memorial

NOVEMBER



Nov 27, 1878 Sir William Orpen born. He exhibited this portrait of a chef at the Royal Academy exhibition of 1921

1914 End of first Battle of Ypres. World Wars 7 478

1936 British government affirmed neutrality and non intervention in Spanish civil war. Spain 7 111

24 1642 Abel Tasman Dutch navigator discovered Van Diemen's Land (Tasmania) 7 228 Australia 1 317 New Zealand, 5 425, Pacific Ocean 6 29

1716 Laurence Sterne British author, born. English Literature 3 288 Novel, 5 471

1859 Darwin's *Origin of Species* published 3 51 Evolution 3 321

25 1562 Lope de Vega Spanish poet and dramatist born. Spanish Literature, 7 122
1835 Andrew Carnegie Scottish manufacturer and philanthropist, born, 2 244 Library, 4 486

1875 Disraeli bought 44 per cent of Suez Canal shares from Khedive Ismail 3-93, Egypt, 3 176, Suez Canal, 7 181

1877 Harley Granville Barker English dramatist and producer born. Shaw, 7-19

26 1379 New College, Oxford, founded
William of Wykeham, Oxford, 6 17, Winchester, 7 457

1844 Carl Benz, German motor engineer, born. Road Transport, 6 413

1948 First movable bridge of aluminum alloy opened at Sunderland. Alloy, 1 114, Aluminum, 1 127 Bridge, 2-68 (picture)

27 8 B.C. Horace, Roman poet, died. Latin Literature, 4-450

1635 Mme de Maintenon, second wife of Louis XIV, born. Louis, Kings of France, 5-42 (picture)

1701 Anders Celsius, Swedish astronomer born. Thermometer, 7-267

1878 Sir William Orpen, British artist born. English Art, 3 262

1941 Surrender of Gondar and end of the Abyssinian campaign. Abyssinia 1-7, World Wars 7 490

28 1520 Magellan, sailing through the strait named after him reached the Pacific 5 77

1836 London University granted charter, 5-33 Universities, 7 368

1912 Albania declared independent of Turkey 1 92 Turkey, 7 345

1943 Tehran war conference opened. Churchill, 2 385, Persia 6 132 Roosevelt, 6-451 Stalin 7 142

29 1667 Edward Hyde, Earl of Clarendon, forced into exile. Charles, British kings, 2 308

1814 *The Times* first printed on steam presses. Printing 6 290

1832 Louisa May Alcott American authoress born. United States Literature, 7 365

1924 Puccini, Italian composer died. Music 5 305, Opera 5 515 516 518 520

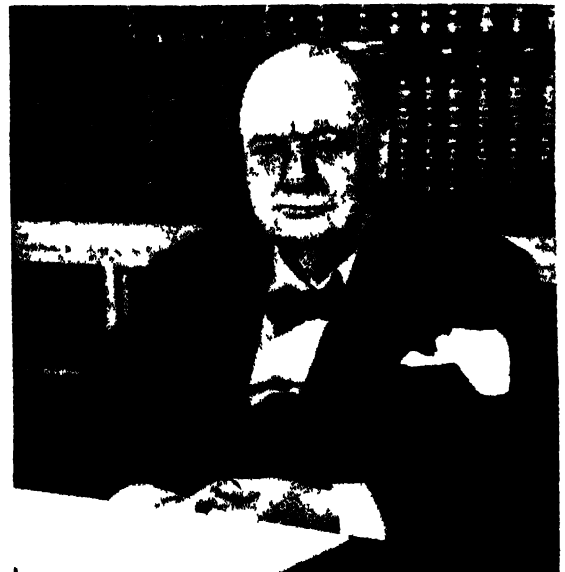
30 ST. ANDREW'S DAY
1667 Jonathan Swift British satirist, born, 7 204 Children's Books, 2 384 English Literature, 3-287

1845 British railway mania (share buying at its height). Railways 6 355

1874 Sir Winston Churchill British statesman born 2-385 facing p 385 (picture). Conservatives 2 487, Marlborough 1st Duke 5 131 Roosevelt, 6 401 Stalin 7-142 United Kingdom, 7-352 353 354 World Wars, 7-487

1936 Crystal Palace destroyed by fire. Exhibitions 3 327, Fireworks 3 360

1939 Finland invaded by the Red Army 3 300 World Wars 7-486



Nov 30 1874 Sir Winston Churchill was born at Blenheim Palace, home of the Dukes of Marlborough. The picture above was taken 79 years later



DECEMBER

Plantations of young fir trees (3-356) and spruce (7-139), are drawn upon heavily to supply the traditional Christmas trees. Older plantations are frequented by the crossbill (3-352), a finch whose mandibles are crossed at the tip to enable it the more easily to extract seeds from the cones. That remarkable, white-berried plant the mistletoe (5-228) is much in evidence as seasonable decoration, as also is holly (4-187); it is worth noting that not all holly leaves have prickles. The tree that produces sweet or Spanish chestnuts (2-332) for roasting or boiling differs markedly from the horse chestnut (4-197) which produces "conkers." Turkey (7-332)—gobbler or bubbly-jock of the farmyard—and fat goose (4-46) are in demand. Flooded meadows are attracting migrant ducks (3-130). As an immigrant from northern Europe, the wood pigeon (6-197) or ring-dove joins the resident British birds. Sleek and shiny and cheerfully noisy, starlings (7-151) roost together at night in enormous numbers. House crickets (2-531) chirp indoors in warm, dark places. Wood brought in for burning is often riddled with tunnels made by the larvae of beetles (1-115); and when loose bark drops away a woodlouse (7-467) may fall with it. Small water-creatures suitable for the aquarium (1-188) are still active, including the lively minnow (6-604), and pond snails, clinging to submerged water-weeds, though one may need to break the ice (4-228) to dip the net.

- 1** 1640 Portugal became independent of Spain. 6-269.
- 1768 Royal Academy of Arts founded. Academy, 1-9; English Art, 3-258; Painting, 6-36 (picture).
- 1783 First ascent in a hydrogen-filled balloon, 1-353.
- 1844 Queen Alexandra, consort of Edward VII, born. 1-100. Edward, Kings of England, 3-169.
- 1889 Most of Hudson's Bay Company's governmental functions transferred to Canada, 4-200; Canada, 2-200.
- 1929 Last British troops left the Rhineland. Germany: History, 4-9.
- 2** 1552 St. Francis Xavier, Jesuit missionary, died in China, 7-506 (picture); Bombay, 1-517; Japan, 4-349; Loyola, 5-46.
- 1594 Mercator, Flemish geographer, died. Maps, 5-118, 119 (picture), 120 (picture).
- 1824 First mechanics' institute founded in London. School, 6-504.
- 1917 Cease-fire between Russian and German armies. World Wars, 7-482.
- 1920 Armenia set up soviet-type government, 1-243; Russia, 6-477.
- 3** 1753 Samuel Crompton, British inventor, born. 2-533; Weaving, 7-434.
- 1795 Sir Rowland Hill, British reformer, born. Post Office, 6-270.
- 1830 Frederick, Baron Leighton, British painter, born. English Art, 3-273.
- 1931 Statute of Westminster passed by Parliament. British Commonwealth, 2-84; Privy Council, 6-292; United Kingdom, 7-352.
- 4** 1808 Napoleon abolished the Inquisition in Spain. Inquisition, 4-263.
- 1829 Suttee (burning of widow on husband's funeral pyre) abolished in India. India, 4-252; Marriage, 5-135.
- 1859 Colony of Queensland, Australia, established, 6-322-24 (pictures).
- 1882 Royal Courts of Justice, London, opened by Queen Victoria. Courts of Justice, 2-521 (picture).
- 5** 1859 Lord Jellicoe, British sailor, born, 4-359; Jutland, Battle of, 4-390; World Wars, 7-481.
- 1901 Walter Disney, American cartoonist, born, 3-92; Cinema, 2-394, 395, 396.
- 1916 Asquith resigned the premiership, 6-20; Liberal Party, 4-485; United Kingdom, 7-351, 352.
- 1926 Claude Monet, French painter, died. French Art, 3-440; Impressionism, 4-236 (picture), 237.
- 6** 342 Death of "Santa Claus" (St. Nicholas of Myra). Christmas, 2-382.
- 1421 Henry VI, King of England, born, 4-163; Roses, Wars of the, 6-453.
- 1857 Joseph Conrad, British (Polish-born) novelist, born, 2-486; English Literature, 3-291; Novel, 5-473.
- 1917 Finland declared its independence from Russian rule, 3-355.
- 7** 1732 Covent Garden Theatre opened. Theatre, 7-266.
- 1941 Pearl Harbour attacked by Japanese aircraft, 6-100; Hawaiian Islands, 4-140; Japan, 4-350; Roosevelt, 6-450; United States: History, 7-363; World Wars, 7-491.

DECEMBER

8 1832 G. A. Henty, British author of boys' books, born. Children's Books, 2-356.
1864 Clifton Suspension Bridge opened. Bristol 2-72 (picture).

1865 Jean Sibelius, Finnish composer, born, 7-47; Music, 5-306.

1914 Battle of the Falkland Islands, 3-339; World Wars, 7-480.

1934 England-Australia air mail instituted. Post Office, 6-272.

9 1917 Jerusalem surrendered to British (formal entry December 11). Allenby, 1-112; Jerusalem, 4-363; World Wars, 7-481.

1941 China declared war on Axis powers (Japan, Germany, and Italy). Chiang Kai-shek, 2-333.

1941 Strong Japanese landings in north Malaya, 5-97; Japan, 4-350.

1949 Dutch second chamber passed bill establishing republic of Indonesia, 4-257.

10 1891 F. M. Lord Alexander, British soldier, born, 1-99. Alamein, 1-88; Dunkirk, 3-137; World Wars, 7-492.

1902 Assuan Dam opened. Dam, 3-33; Egypt, 3-172, 173; Nile, 5-440.

1928 New London Underground station at Piccadilly Circus opened. Underground Railways, 7-346 (picture diagram).

1941 British battleships *Prince of Wales* and *Repulse* sunk by Japanese aircraft. Navy, 5-343; World Wars, 7-491.

11 1843 Robert Koch, German bacteriologist, born, 1-343-44; Germs, 4-14; Medicine, 5-164 (picture).

1936 Abdication of Edward VIII, 3-169; George V, 3-522; George VI, 3-522; United Kingdom, 7-352.

1941 Germany and Italy declared war on the U.S.A. World Wars, 7-491.

1945 Formal opening of the new Waterloo Bridge. Bridge, 2-65 (picture). 66; London, 5-25 (picture).



Dec. 10, 1928. This circular arcade at Piccadilly Circus Underground station, London, is just below street level.



Dec 14, 1918. A mother with her family registers her vote for the first time at the British post-war election.

12 1821 Gustave Flaubert, French novelist, born. France: Literature, 3-456; Novel, 5-472.

1901 Marconi received his first transatlantic wireless message, 5-122; Radio, 6-340, 342, 343, 345.

1911 George V's great Coronation Durbar at Delhi. Delhi, 3-65; India: History, 4-253 (picture), 254.

1925 Riza Pahlevi became Shah of Persia, 6-132.

13 1545 First assembly of the Council of Trent. Reformation, 6-378; Roman Catholic Church, 6-426.

1553 Henry IV of France (Henry of Navarre), born, 4-164; France: History, 3-450; Huguenots, 4-202; Nantes, 5-316.

1818 Ernst Werner von Siemens, German engineer, born. Iron and Steel, 4-294.

1939 Battle of the River Plate. World Wars, 7-488.

14 1324 Pierre Puvis de Chavannes, French painter, born. France: Art, 3-440.

1895 George VI, King of England, born, 3-522; Elizabeth, the Queen Mother, 3-236; Elizabeth II, 3-233; Margaret, Princess, 5-124.

1918 First British general election in which women voted (supported a coalition government). Lloyd-George, 4-531; United Kingdom, 7-352; Vote, 7-407.

15 37 Nero, Roman emperor, born, 5-367. Christianity, 2-379; Rome: History, 6-437.

1610 David Teniers (younger), Flemish painter, baptised. Netherlands: Art, 5-382, 390 (picture).

1734 George Romney, English painter, born. English Art, 3-259 (picture), 260.

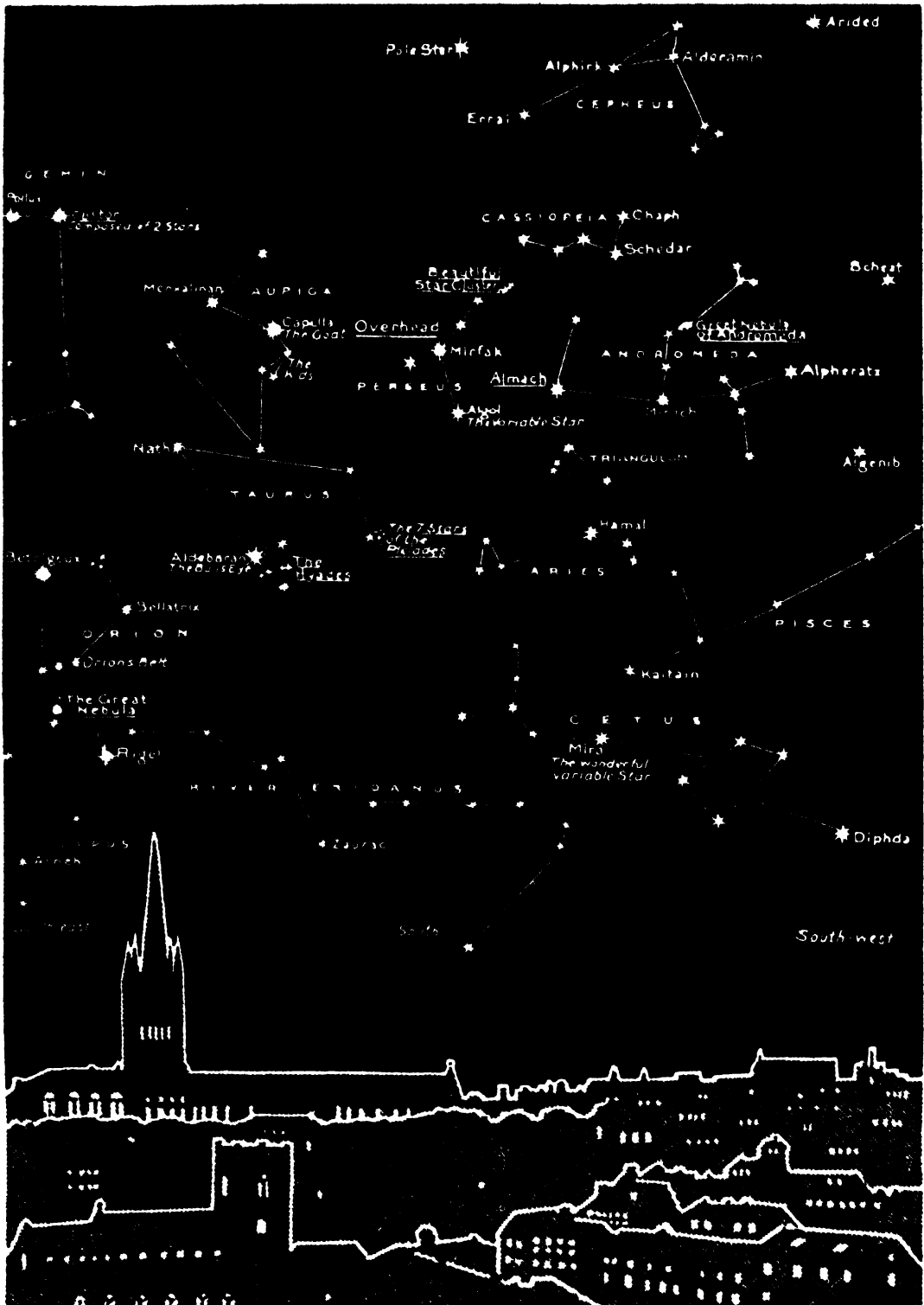
1832 Alexandre Eiffel, French engineer, born. Paris, 6-79 (picture), 84.

1927 Prayer Book revision measure defeated in House of Commons, 6-280.

16 1714 George Whitefield, English preacher, born. Wesley, John, 7-440.

1773 "Boston Tea Party," opening the War of American Independence, 1-137; Boston, 2-22.

DECEMBER



THE STARS IN DECEMBER. With this map you can study the stars from the middle of December to the middle of January. You are looking southward in Norwich and can see the cathedral on the left of the picture. The stars, clusters, and nebulae that are underlined in the map should be viewed with a telescope or with field- or opera-glasses

DECEMBER



Dec. 16, 1775. Jane Austen's house at Chawton, Hants where the famous novelist lived during the years 1807-17

- 1775** Jane Austen, English novelist, born, 1 311. English Literature, 3-290; Novel, 5-472.
1838 Defeat of Dingaan, Zulu chief, by the Boers: anniversary kept in South Africa as The Day of the Vow. Natal, 5-335.
1911 Amundsen reached the South Pole. Polar Exploration, 6-244.

- 17** **1807** John Greenleaf Whittier, American poet, born. United States: Literature, 7-364.
1903 Orville Wright made the first flight in a heavier-than-air machine. Aeroplane, 1-26, 38.
1907 Lord Kelvin died, 4-395. Cable, 2-153; Joule, 4-385; Radio, 6-341.
1939 German battleship *Admiral Graf Spee* scuttled. World Wars, 7-488.
1944 Rundstedt's final counter-offensive in the Ardennes began. Ardennes, 1-222; World Wars, 7-495.

- 18** **1707** Charles Wesley, English divine and hymn-writer, born, 7-439. Free Churches, 3-464; Hymns, 4-226.
1786 Carl Maria von Weber, German composer, born. Opera, 5-514.
1829 Lamarck, French zoologist, died. Evolution, 3-321; Zoology, 7-526.
1856 Sir J. J. Thomson, British physicist, born. Atom, 1-297; Electron, 3-221.
1865 Slavery abolished in U.S.A., 7-66. United States: History, 7-362.
1914 British protectorate over Egypt proclaimed, 3-178.

- 19** **1790** Sir William Parry, British Arctic explorer, born. Canning, 2-212.
1851 J. M. W. Turner, British painter, died, 7-337. English Art, 3-261, 269 (picture): Painting, 6-34.

- 20** **1192** Richard Coeur de Lion captured by Leopold of Austria, 6-399; Crusades, 3-2.
1845 State of Texas incorporated in the United States, 7-260; United States: History, 7-362.

- 21** **1118** Thomas Becket, English prelate, born, 1-402; Canterbury, 2-213; Henry, Kings of England, 4-162.

1846 First major surgical operation in Europe under a general anaesthetic carried out by Robert Liston. Anaesthesia, 1-142.

1879 Josef Vissarionovich Stalin, Russian dictator, born, 7-141. Georgia, 3-524; Russia: History, 6-476; Trotsky, 7-318.

1920 World's first regular broadcasting station opened in the United States. Radio, 6-346.

- 22** **1716** First pantomime in England played at Lincoln's Inn theatre, 6-60; Harlequinade, 4-133.

1768 John Crome ("Old Crome"), British painter, born. English Art, 3-260, 269 (picture); Norwich, 5-467.

1808 Beethoven's 5th and 6th ("Pastoral") Symphonies first played, at Vienna, 1-411; Music, 5-305; Orchestra, 5-527.

1916 Ministry of Pensions set up. Pensions, 6-120.

- 23** **1732** Sir Richard Arkwright, English inventor, born, 1-239. Spinning, 7-136; Weaving, 7-434.

1777 Alexander I, Emperor of Russia, born. Napoleon I, 5-320, 322; Russia, 6-474.

1827 "Lord" George Sanger, circus proprietor, born. Circus, 2-404.

1834 Hansom cabs patented. Road Transport, 6-412 (colour plate, facing p. 412).

1920 Government of Ireland Act passed, 4-283.

- 24** **1167** John, King of England, born, 4-378; English History, 3-277 (colour plate, facing p. 277); Government, 4-58; Magna Carta, 5-80.

1491 Ignatius de Loyola, founder of the Jesuits, born, 5-46. Reformation, 6-377.

1924 Ahmed Ben Zogu (later King Zog) led insurrection, overthrowing Albanian government. Albania, 1-92.



Dec. 23, 1834. The popularity of the hansom cab (above) declined with the swift increase in motor traffic

DECEMBER



Dec. 27, 1673. St. Helena (above), home of the exiled Napoleon, where he died, has an area of 47 square miles.

25 CHRISTMAS DAY, 2-381-82; Holly, 4-187; Jesus Christ, 4-363; Mistletoe, 5-228; Fig, 6-197.

1497 Vasco da Gama touched Natal coast, 7-382; Africa, 1-53; Natal, 5-325; South Africa, 7-89.

1941 Hong Kong surrendered to the Japanese, 4-191 (picture).

26 BOXING DAY. Christmas, 2-382.
1716 Thomas Gray, English poet, born, 4-67 (picture), 68; English Literature, 3-288; Walpole, H., 7-416.

1776 British defeated by American revolutionary forces at Trenton, New Jersey. New Jersey, 5-398.

1944 Russians closed in on Budapest, 2-105, 106 (pictures); Danube, 3-48; Hungary, 4-205, 207 (picture).

27 ST. JOHN THE EVANGELIST'S DAY.
1571 Johann Kepler, German astronomer, born, 4-401.

1673 Island of St. Helena chartered to East India Company. Napoleon I, 5-323.

1822 Louis Pasteur, French chemist, born, 6-94, 95 (picture); Canning, 2-212; Milk, 5-207; Surgery, 7-194; Tartaric Acid, 7-288.

1904 Barrie's *Peter Pan* first played on London stage, 1-372, 373-76 (picture story); Children's Books, 2-354, 355 (picture); English Literature, 3-291.



Dec. 29, 1809. Hawarden Castle, Flintshire, North Wales (above), for many years the residence of W. E. Gladstone, four times prime minister of Great Britain, was erected in 1752 by an ancestor of Mrs. Gladstone, to whom it passed in 1874.

28 1065 Westminster Abbey consecrated, 7-442-44 (pictures); Britain, Battle of, 2-79; London, 5-19, 24; Edward, Kings of England, 3-166.

1846 Bloemfontein, Orange Free State, founded, 1-488; Orange River and Free State, 5-524 (picture).

1908 Messina, Sicily, virtually destroyed by an earthquake. Earthquakes, 3-153; Sicily, 7-49.

1929 Chinese Nanking government abolished foreign territorial rights. China, 2-373, 375.

29 1809 William Ewart Gladstone, British statesman, born, 4-26 (picture); Huxley, 4-212; Liberal Party, 4-185; Oxford and Asquith, 6-21; United Kingdom, 7-350, 351; Victoria, Queen, 7-396.

1895 The Jameson Raid penetrated into the Transvaal. Rhodes, 6-393; South Africa, 7-92.

1940 Great fire-bomb air raid on the City of London, 5-20, 28; Britain, Battle of, 2-78-79; World Wars, 7-488-89.

30 1460 Richard, Duke of York, killed at battle of Wakefield. Roses, Wars of the, 6-154.

1865 Rudyard Kipling, British poet and short story writer, born, 4-412-13 (picture); Children's Books, 2-354, 355 (picture); English Literature, 3-291.

1869 Stephen Leacock, Canadian humorist and educationist, born. Canada, 2-203.

1922 Union of Soviet Socialist Republics constituted by treaty. Russia, 6-472, 476, 477.

1947 King Michael of Rumania abdicated. Rumania, 6-470-71.

31 NEW YEAR'S EVE. Scots Hogmanay celebrations. New Year's Day, 5-410-11.

1384 John Wycliffe, English reformer and translator of the Bible, died, 7-505; Bible, 1-442; English Literature, 3-281; Huss, 4-211.

1600 Honourable East India Company chartered by Queen Elizabeth I. India: History, 4-252-53; America, Discovery, 1-134; American Independence 1-137; Bengal, 4-428; British Commonwealth, 2-83; Clive, 2-411; Elizabeth I, 3-232; Hastings, W., 4-136; United Kingdom, 7-350.

1763 Villeneuve, French admiral, born. Trafalgar, Battle of, 7-304.

1935 Great earthquake at Quetta, India. Earthquakes, 3-153.



STUDY OUTLINES

References to information
scattered through volumes
1-7 are here assembled
subject by subject for the use
of Students, Teachers, and
Others in search of Knowledge

A Note about The Book of Knowledge Study Outlines

WHILE the Fact-Index, which begins in page 205, brings out details of subjects and tells exactly where to find them, the following Study Outlines gather up the information in **THE BOOK OF KNOWLEDGE** into the groups that form the main divisions of human knowledge, and present it arranged for systematic study. The Geography Outline, for instance, brings together into a single consecutive chain all the material on Geography contained in Volumes 1 to 7, fitting each part into the other, link by link, until the whole of Geography has been surveyed.

THESE Study Outlines, however, are much more than mere "guides to reading," much more than mere titles of articles or of portions of articles arranged in tabular form. A glance through them will show that their subdivisions consist for the most part of brief notes and explanations which serve to bring out the significance of each step and its relation to what precedes and what follows. In other words, they are skilled teachers in print. It would be profitable, indeed, simply to read through many of these Outlines without looking up a single page reference, for each of them gives a rapid survey of the subject with which it deals. On the other hand, they are so arranged that those interested in only a single section of a wide field of study can use that section independently.

At the end of the Outlines is a list of books for supplementary reading. Many are not expensive to buy, and all will almost certainly be found in a good public library.

AS in the other sections of this volume, in indicating to you where to find information elsewhere in **THE BOOK OF KNOWLEDGE**, the number of the volume is given first, followed by the page number in that particular volume. Thus the reference **7-245** would mean that you should consult Volume 7 at page 245. The number of the volume is always in **black-face** type, the number of the page is also in **black face** when the reference is to the main article on a given subject, in light face when the matter is mentioned in some other main article. Thus **7 245** means that in page 245 of Volume 7 you will find the main article on the subject, **5-320** means that in page 320 of Volume 5 you will find a passing reference to it.

List of Study Outlines

Agriculture	Central America	Painting
Architecture	South America	Physics
Astronomy	Heat (<i>see</i> Physics)	Mechanics
Atomic and Nuclear	History	Heat
Physics (<i>see</i> Physics)	Ancient	Sound
Biology	Medieval	Light
Botany	Modern	Atomic and Nuclear
Chemistry	English	Physics
Economics (<i>see</i> Social	British Commonwealth	Physiology, Hygiene,
Sciences)	American	Medicine
Electricity and Magnetism	Household Science	Political Science (<i>see</i> Social
Geography	Industries and Applied	Sciences)
Physical	Sciences	Sculpture
Divisions of Mankind	Language and Literature	Social Sciences
Europe	Light (<i>see</i> Physics)	Sociology
British Isles	Mechanics (<i>see</i> Physics)	Economics
British Commonwealth	Mathematics	Political Science (Civics)
Africa	Minor Fine Arts	Sociology (<i>see</i> Social
Asia	Music	Sciences)
North America	Mythology	Sound (<i>see</i> Physics)
	Nature Study	Zoology

The Outlines follow in alphabetical order

AGRICULTURE

IT was a great day in the history of the human race when some ancient nomad first decided to settle down and begin scratching the soil with a sharp stick so that it would grow crops for him. Gradually men added one food plant after another to their stock, they learned to domesticate animals, they grew flax and clipped the wool of their sheep that wives and daughters might spin and weave clothes for the household. Meanwhile, the sharpened stick had given way to the ploughshare, and the forward march of human culture was measured by the improvements in agriculture. To this day Agriculture (1 70), remains the foundation of civilization.

I SOIL AND ITS COMPOSITION (7 83)

A Water essential to fertility (6 360)

B Artificial treatment of the soil

a Moisture is supplied by irrigation and drainage

b Chemical elements are supplied by animal manure, fertilisers (1 78), guano (*f v*), nitrogen and soil enriching crops (6 99, 6 217, 218, 5 444), lucerne (5 48), clover (2 423), mustard (5 312), soya bean (7 103).

Note For soil formation and kinds of soil, see Physiography (6 186)

II. DOMESTIC PLANTS.

A Propagation (3-504) Seeds and seed selection (6 216, 6 528), bulbs, tubers, root stocks (2 118), grafting (3 478), harvesting (4 134, 7 447)

B Cereals. Wheat (7 447), oats (5 490), rye (6 482), barley (1 368), rice (6 396), millet (*f v*), maize (5 90)

C Pasture and Hay Crops Grasses (4 63), clover (2 423), lucerne (5 48), legumes (*see* Leguminosae, *f v*) soya bean (7 103)

D Vegetables.

a Legumes Beans (1 390), peas (6 99), lentils (4 482)

b. Bulbs, Tubers, Roots, etc. (2 118) Beet (1 410), parsnips (6 93), onions (5 511), potatoes (6 273), radishes (2-151), turnips (2 151), artichokes (1 257), tapioca (7 226)

c Other Vegetables. Asparagus (1 274), cabbage, brussels sprouts, kale, cauliflower (2 151), watercress (7 428), celery (2 286), cucumber (3 9), lettuce (*f v*) rhubarb (6 396), tomato (5 131)

E. Spices and Condiments (7 131) Cloves (2 423), Ginger (4 21), nut (5 222), mustard (5 312), nutmeg and mace (5 486), pepper (6 121), vanilla (7 381)

F. Sugar (7-183), cacao (2 438), coffee (2 444), tea (7 232), tobacco (7 286), hops (4 192)

G. Fibre Crops: Cotton (2 516), flax (3 387), hemp (4 161), jute (4 389), sisal (7 58)

H Fruits and Fruit-Growing (3 478)

a. Orchard Fruits Apple (1 185), apricot (1 186), cherry (2 327), mulberry (5 289), peach (6 99), pear (6 100), plum (6 228), prunes (6 298), quince and medlar (6 324)

b Soft Fruits Currants (3 12, 483), gooseberry (4 47), grape (4 61), loganberry (3 399), raspberry (6 364), strawberry (7 173)

c Tropical and Semi-Tropical Fruits. Banana (1 359), breadfruit (2 52), date (3 52), fig (3 350), grapefruit (4 61), lemon (4 477), lime (4 509), mango (5 113), melon (5 167), olive (5 507), orange (5 524), pineapple (6 204), pomegranate (6 256)

I Nuts. (5 486)

a Temperate Zone Nuts Chestnuts (2 332), pistachio (5 487), hazel, cobnut, etc (4 143), walnut (7 416)

b. Sub-Tropical and Tropical Nuts Almond (1 117), brazil nut (5 487), coconut (2 441)

J. Vegetable Oil Crops

Oils and fats (5 506), ground nuts (4 98), coconut palm (copra) (2 441), cotton (2 516), olive (5 507), sunflower (7 190), soya bean (7 103)

K Medicinal and Miscellaneous Crops Opium (5 521), quinine (6 325), camphor (2-192), rubber (6 464), maple sugar (5 117), cork (2 505)

III LIVESTOCK AND LIVESTOCK PRODUCTS

A Stock Raising and the Effects of Careful Breeding (2 273)

B Common Domestic Animals and their Products

a Draught Animals Horse (4 196), mule (5 292), ass (1 275)

b. Cattle (2 273) and Pigs (6 196), meat (5-153)

c Sheep (7 20) and Wool (7 473)

d. Goats (4 37)

e Poultry (6 277) Turkey (7 332), duck (3 130), geese (4 46), guinea fowl (4 104), pigeons and doves (6 197)

f. Insect Products Bees and honey (1 405), silkworms (7 53), shellac (4 434), cochineal (2 436)

g. Dairy Farming (3 25) Milk (5 205), butter (2 134), cheese (2 313), cream (2 293)

h. Other animal products Leather (4 466), feathers (3 344), furs (3 496)

C Domestic Animals peculiar to certain regions

Alpaca (1 119), buffalo (2 109), camel (2 183), llama (4 530), reindeer (6 379), yak (7 511), ostrich (6 8)

AGRICULTURE—ARCHITECTURE

IV. ENEMIES AND FRIENDS OF THE FARMER.

- A. Animal Pests :** Vices (5 288); rats (6 365); insects (4 264); aphids (1 182); beetles (1 412); caterpillars (2 263; 2 136; 4 448); grasshoppers and locusts (4 64); weevils (7 435).
B. Harmful Plants : Poisonous plants (6 235); thistles (7 270); charlock (5 312), and other weeds; rusts and smuts (6 481).
C. Farmers' Helpers : Bats (1 380), birds

(1-453); dogs (3 100); frogs (3-472); toads (7-286); ferrets (3 348); badgers (1-345); lady birds (4 436); hover-flies (4-267); bacteria (1-343, 5-443); centipedes (2 291).

V. FARMING MACHINERY, ETC.

Windmill (7 459); ploughs (6 223) and sowing machines; binders, reapers, threshing machines, etc.; milking and milk cooling machinery (3 27)

ARCHITECTURE

MEN began to build primitive huts and encampments long before they possessed the materials or thought out the principles upon which they have based the art and science of Architecture (1 209) the name for the ordered, comely, sometimes magnificent building carried on through the centuries.

I. EGYPTIAN ARCHITECTURE (3 185)

- A. Characteristics :** Vast tombs of kings and solemn temples of the gods built by an enslaved population, massive stone buildings of the "column and lintel" type, with walls often sloping instead of perpendicular on the outside; use of column foreshadowing Greek architecture; profuse ornamentation, both carved and painted.
B. Notable Examples : Pyramids (6 312), Temples (3 185 189), Sphinxes (7 130)

II. BABYLONIAN AND ASSYRIAN ARCHITECTURE.

- A. Characteristics :** Gorgeous temples and palaces set on broad terraces, approached by imposing stairways and built of baked or sun-dried brick and enamelled tile, stone used in later period arch and turret forms common.
B. Typical Examples : Hanging Gardens of Babylon (1 336 illus. f.; 1 377 illus. f.), Ishtar Gate (1 337), Shrine at Ur (7 369)

III. GREEK ARCHITECTURE (5 531, 532)

- A. Characteristics :** The Aegean civilizations of Crete (1 23) and Mycenae (1 24) laid the foundations of Western Architecture from which the Greeks evolved their own. Characteristics of Greek architecture are: noble temples, theatres, gymnasia, etc., "column and lintel" type of structure, built of marble or of coarser stone covered with stucco, sometimes without roof, sometimes roofed with tiles or slabs supported on wooden beams, three styles or "orders" Doric, Ionic, Corinthian (5 532, 521 illus.)
B. The Three Great Styles :
 a. **Doric.** Parthenon (1 210); temple at Bassae (4 82); of Zeus, Olympia (4 72 illus. f.)
 b. **Ionic.** Temple of the Wingless Victory (4 82); Mausoleum at Halicarnassus, and Temple of Diana (7 1); Erechtheum (4 75 illus. f.).
 c. **Corinthian.** Monument of Lysicrates (4 81)

IV. ROMAN ARCHITECTURE (5 532)

- A. Characteristics :** Stately, showy temples, monuments, basilicas, forums, amphitheatres, and circuses, and highly practical aqueducts and baths; richly ornamented structures built

of brick, stone, and cement and concrete, and faced with brick, marble, or mosaic; structural forms included the arch, the vault, the dome, and columns of the three Greek orders were used frequently.

- B. Notable Examples :** Pantheon (1 211), Colosseum (2 461), Forum (6 435 illus. f.), Baths of Caracalla (6 429 illus. f.); Arch of Severus (6 427), of Constantine (6 447), Hadrian's Wall (2 75, 3 275), aqueducts (1 188, 6 466), residences at Pompeii (6 448).

V. BYZANTINE ARCHITECTURE (1 210)

- A. Characteristics :** Huge squat churches, with magnificent interiors; domes placed over rectangular compartments by means of pendentives; buildings constructed of brick and stone faced with precious marbles and gorgeous mosaics. Much of this style is seen in Russian and Mahomedan architecture.
B. Notable Examples : St. Sophia at Constantinople (4 304), St. Mark's Cathedral at Venice (7 357)

VI. MAHOMEDAN ARCHITECTURE

- A. Characteristics :** The architecture of the Mahomedans called also Moorish, Saracenic, and Arab architecture has many common features throughout the range of their religion. These include graceful gay hued mosques with bulbous domes, round, lancet, and horseshoe arches, slender minarets, and fretted screens in geometric patterns or arabesques, built of all structural materials, including marble, and decorated with exquisite mosaics and inlay of silver, gold, enamel, and semi-precious stones.
B. Typical Examples :
 a. **India :** Taj Mahal (7 219).
 b. **Persia :** Grand Mosque, Isfahan (6 433)
 c. **North Africa and Spain :** Moroccan gateway (5 265); Alhambra (1 111); Cordoba (7 115); Seville (7 5).

VII. ROMANESQUE ARCHITECTURE.

Called "Lombard" and "Tuscan" in Italy, "Romano" in France, "Rhonish" in Germany, and including the "Saxon" and "Norman" of Britain. Probably originated about A.D. 600 in

ARCHITECTURE

Lombardy and thence spread about A.D. 1000 westward and northward as well as south (to Sicily). To this period belong the great castles of Britain (2 256).

A Characteristics Dignified churches and palaces and massive castles, round arches framing doors and windows and springing from round columns or piers, thick stone walls pierced with small windows, roofs at first flat and timbered, later vaulted in stone by means of the plain barrel or groined vault, decoration varies locally from crude and spare to rich and exuberant.

B Notable Examples

- a Southern Romanesque Pisa (6 207)
- b Northern Romanesque Durham (2 271)
- Tower of London (7 302) Clarendon Castle (2 260)

VIII GOTHIC ARCHITECTURE

Divided into periods in different countries, Lanct, Rayonnant and Flamboyant, in France, Early English, Decorated and Perpendicular in England. This is the great period of cathedral building (2 284).

A Characteristics Wonderfully varied forms, emphasising the vertical line and reaching to new heights, with great lofty window spaces filled with stained glass, pointed arch completely superior to rounded types, and ogival vaulting with flying buttresses permits stone walls to be far thinner than in Romanesque buildings and to consist chiefly of windows, decoration varied, often consisting in ecclesiastical buildings of finely sculptured figures.

B Notable Examples

- a Continental Northern Gothic Notre Dame, Paris (6 81), Amiens (1 139), Reims (5 449), Bruges (2 98), Antwerp (1 179)
- Southern Gothic Florence (3 302), Milan (5 204)
- b English Gothic (i) Early English transitional from Norman York (2 269), Lincoln (2 266), Salisbury (2 260), Wells (2 272)
- (ii) Decorated, typified by floral ornament, rose windows, Glasgow (4 29)
- (iii) Perpendicular tall narrow rectangular windows, fan vaulting, nave at Canterbury (2 268), Magdalen Tower, Oxford (6 19), Henry VII chapel, Westminster (7 144)
- c Domestic architecture Houses in Dunzig (3 48), Tudor timbered Row at Chester (2 311), Hampton Court (4 124)

IX RENAISSANCE ARCHITECTURE

A Characteristics Sumptuous palaces, chateaux and churches, expressing not the spirit of whole peoples but the whims and moods of luxurious intellectual aristocracies, formal and classical by intention, most of the detail borrowed from Roman antiquity, ended in the overornamentation of Baroque and Rococo, no new structural features.

B Notable Examples

- a Continental St Peter's, Rome (6 428, 7 382), Palazzo Vecchio, Florence (4 318), Louvre (5 46) and Opera House (6 83), Paris
- b In England. This was the great period of English architecture with which are associated

the names of Wren (7 500), Inigo Jones (4 381), Vanbrugh, Nash and the brothers Adam (1 14). St. Paul's Cathedral (6 487), St. Bride's, typical Wren church (5 21). The later architects working at first in the classical Palladian style evolved gradually the fine English Georgian houses from which present-day English domestic architecture is descended.

X MODERN ARCHITECTURE

A Characteristics After the Renaissance the broad national movements in Architecture virtually ceased and new designs were the products of individual architects (see above), who originated a wide variety of schools more or less independent of one another. It was only with the advent of steel and concrete (see Building Construction, 2 111) that great new structural principles were evolved, but even so in many ways old traditions lingered and as noted the traditional big English house is directly descended from Georgian structures. From C. R. Mackintosh through Le Corbusier and Mallet Stevens, functionalism spread everywhere, in this style materials and buildings were primarily suited to their express purposes, and no effort was made, for example, to provide ideal conditions for the use of a building. Thus a factory where workers work better with plenty of light is nearly all windows, as a school (1 213). A theatre is built to solve the problem of theatre (7 171), a concert hall to solve the problem of musical production.

B Further Examples

- a America In America steel and concrete bridged the skyscraper, first constructed in Chicago (2 334) and put and made its own by New York (1 216, 5 416)
- b Continental and elsewhere Finland (1 215), Rotterdam (6 406), Russia (6 475), Tel Aviv, India (1 271)
- c English
 - 1 Besides such examples as these referred to above, functional simplicity extends to public works, as in (2 478), Battersea Power Station (4 100)
 - 2 Where necessary old traditional styles are followed, Bank of England (1 362), County Hall, London (5 24)
 - 3 Much revived Gothic was built in Britain in the 19th century, Houses of Parliament (5 24)

XI OTHER ANCIENT ARCHITECTURE

This includes isolated types of architecture that have played no part in the great chain of development dealt with above.

A Chinese and Japanese Architecture

- a Characteristics Gray, bright comparatively fragile pagodas and memorial gateways built of wood, brick, glazed tile, and less often of stone, feature the tent-like curved roof
- b Examples The Great Wall (2 362), Japan (4 344, 345)

B Hindu and Buddhist Architecture

- a Characteristics Strange tombs, shrines and temples, often scooped from the living rock of caves and hills, or built of stone with high

ARCHITECTURE — ASTRONOMY

pyramidal towers, fantastically ornamented.

b. **Examples:** Buddhist temples (2-180; 4-356); Karli (4-246); Jaipur (4-247); Siam (7-45).

C. American Indian Architecture.

a. **Inca Architecture:** Structures composed of stones, often huge boulders, without mortar, but cut and fitted with extreme accuracy (6-140).

b. **Maya Architecture.** Earliest great period in Central America and Mexico. Stone faced

with stucco. Narrow rooms, wide roofs necessitated by the false arch.

c. **Toltec and Aztec Architecture.** Houses of sun-dried brick and great pueblos, usually of stone; pyramid-temples and palaces of brick or stone elaborately decorated with carvings and gilding (1-331).

d. **North American Indian Architecture:** Log dwellings of most advanced hunting tribes; stone dwellings of the Cliff Dwellers; sun-dried brick dwellings of the Pueblo Indians.

ASTRONOMY

LONG before any of the other great sciences had been organized, men were busy investigating the mysteries of the heavens, and out of the speculations and observations of these early "star-gazers" came some of the most profound scientific truths which are described under the heading Astronomy (1 278).

I. HISTORY.

A. Ancient. The earliest astronomical observations were made on the banks of the Nile and the Euphrates, in desert climates where the stars shone clearly every night. The first grouping of stars into constellations (2-489) dates from this early period. By the time the Greek philosophers addressed themselves to the subject, records going back for many centuries were already available.

Ptolemaic System. Ptolemy (6-301) set forth in the 2nd century A.D. the views which Hipparchus (190-120 B.C.) had elaborated from a suggestion of Eudoxus (4th cent. B.C.). These pictured a spherical earth in the centre of the universe, surrounded by nine transparent crystal spheres. To the first seven were attached (in order) the Moon, Mercury, Venus, the Sun, Mars, Jupiter, and Saturn. Over the whole surface of the eighth were scattered the fixed stars. The ninth was the "prime mover" whose rotation accounted for the daily motion of all the heavenly bodies. This basic pattern was elaborated by locating the centres of the spheres at a distance (called the eccentric) from the centre of the Earth, and by setting the Sun, Moon, and planets on smaller spheres (called epicycles) attached to the main spheres.

B. Modern.

a. **Copernican System.** The theory that the Sun, not the Earth was the centre of the universe was held by Aristarchus in the fourth and Seleucus in the second century B.C., but was not generally accepted until revived by Copernicus (2-501) in the early 16th century A.D.

b. **Tycho Brahe (1546-1601)** put forward a theory that the Moon and Sun revolved round the Earth while the other planets revolved round the Sun (2-38).

c. **Johann Kepler** returned to the Copernican system and worked out the three laws of

planetary motion that still go by his name (4-401).

d. **Galileo** turned the newly-invented telescope on to the heavens. His discovery of four satellites revolving round Jupiter, and of spots which revealed the rotation of the Sun, offered visual confirmation of the Copernican theory (3-498).

e. **Newton (5-408)** brought all the known facts under a single mathematical theory embodied in his three laws of motion (5-159) and the law of universal gravitation (4-65).

f. **Laplace**, in the *Mécanique Céleste* (1799-1825), completed the application of Newtonian theory to all the more important movements of bodies in the solar system.

g. **Einstein**, in his General Theory of Relativity (6-380), substituted a geometrical for a mechanical picture of the operation of gravity, and was able to explain certain anomalies (e.g. in the motion of Mercury) which did not exactly accord with Newtonian theory.

II. THE UNIVERSE.

A. The Solar System.

a. **The Sun (7-188)** is a star of rather less than average mass and brightness. Its diameter is about 864,000 miles, its mean distance from the earth about 93,005,000 miles. The temperature of its surface is between 5,000° and 6,000°C. and its colour is yellow. Markings called sunspots are visible on its surface; eruptions of luminous gas can be seen at eclipses (3-156); electrons and other particles are emitted, which disturb radio communications and give rise to the appearance called the aurora (1-310).

b. **Planets (6-212).** There are nine known planets revolving round the Sun in elliptical orbits. They are (in order from the Sun outwards): Mercury, Venus (7-388), Earth (2-149), Mars, Jupiter, Saturn, Uranus (7-370), Neptune (5-367), Pluto (6-228).

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c. Asteroids. Instead of one planet in the gap between Mars and Jupiter there are a large number of small bodies called asteroids, each revolving round the Sun in its own elliptical orbit (6-212).

d. Satellites. At least six of the nine planets have one or more smaller bodies revolving round them (6-213). The Earth's satellite, the Moon, is 2,160 miles in diameter. Its mean distance from the earth is 238,900 miles, and its mass 0.01227 of the mass of the Earth (5-256).

e. Comets. These are believed to be loose collections of stones, dust, and gas which travel on highly eccentric orbits round the Sun. Their origin is obscure, and their sporadic disintegration unexplained (2-468).

f. Meteors. Small pieces of debris from the size of a grain of sand upwards constantly enter the Earth's atmosphere and become incandescent with friction. The occasional one which lands on the Earth's surface is called a meteorite (5-181).

g. The Earth's Movements. The daily rotation of the Earth gives rise to night and day, and to the diurnal passage of the stars (7-146). The annual revolution round the Sun, combined with the inclination of the Earth's axis to the plane of its orbit, produces the seasons (6-526), the equinoxes and the solstices (3-294).

h. Eclipses. An eclipse of the Moon occurs when the Moon enters the Earth's shadow; of the Sun when the Moon comes between the Earth and the Sun (3-156).

i. Origin of the Solar System. A number of theories have been put forward to account for this, but none is universally accepted. Best known are the nebular hypothesis (6-213), the planetesimal theory (6-214), the tidal theory (6-214), Alfvén's magnetic theory, Weizsäcker's theory of roller-bearing eddies, and Hoyle's theory that it resulted from a supernova explosion of the sun.

B. The Galactic System.

a. The Milky Way. The trail of more or less diffused light that circles the heavens (1-278) is really made up of vast numbers of separate stars, seen close together on account of the shape of the galaxy, or collection of stars, in which the solar system is located.

b. Shape and Size. The galaxy is disc- or wheel-shaped, and probably spiral in structure, with the Sun some two-thirds out on one arm or spoke. It is about 120,000 light-years in diameter, and 20,000 light-years thick at the hub.

c. Revolution. Different parts of the galaxy are revolving at different rates. The Sun is carried round about once every 225 million years at a speed of some 170 miles per second. At the same time the Sun and a cluster of the nearer stars seem to be moving at a speed of about $12\frac{1}{2}$ miles a second relative to the rest of the galaxy.

d. Stars. These are concentrated balls of gas which give off light because of their high temperature. This is maintained over many millions of years by processes of nuclear fusion. Stars are classified according to their magnitude or apparent brightness, and according to size, temperature, and the quality of the light which they emit. Many (called binaries) are in the form of two bodies revolving round each other (7-145).

e. Cosmic Dust. Besides stars, the galaxy contains clouds of dust (1-283) and luminous gas.

C. Outer Space.

a. Spiral Nebulae. Scattered through outer space are large numbers of spiral nebulae (5-360) which appear to be separate island universes in all respects similar to our own galaxy (1-284).

b. Expanding Universe. The light from all of them shows a shift of spectroscopic lines towards the red. If this is interpreted as a Doppler effect, all must be moving away from us at a speed proportional to their distance. This has been taken to imply an expanding universe, and different formulæ have been put forward by Einstein, de Sitter, and others to define the expansion.

D. Radio Astronomy. It has been discovered that high frequency radio waves reach the earth not only from the sun, but from many other directions in space. Very few of these other sources, however, seem to coincide with known objects in the galaxy, and no satisfactory theory has yet been put forward to account for the production of radio waves by ordinary stars, invisible stars, gas clouds, or any other agency (7-250).

III. PRACTICAL APPLICATIONS.

A. Observatories. Most of the larger countries maintain one or more observatories (5-493) to promote both theoretical and practical astronomy. The chief instruments used are reflecting and refracting telescopes (7-248), spectroscopes (7-127), spectrohelographs (5-493), coelostats (7-189), transit instruments (7-149). Radar equipment is used for tracking meteors (5-182), and highly directional short-wave radio receiving instruments (radio telescopes) for other branches of radio astronomy (7-250).

B. The Calendar. The problem of the calendar (2-174) is chiefly the problem of reconciling the incommensurable lengths of the day (3-55), the month (5-255), and the year (2-174). There are also complicated rules for determining the date of Easter (3-154) and other movable feasts in any given year.

C. Measurement of Time. The final criterion for the measurement of time (7-277) was formerly the rotation of the earth. This gives the sidereal day, or the time that elapses between two successive transits of a fixed star across a given

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meridian (3-55). But it was discovered that the rotation of the earth is slightly irregular, and gradually slowing down; so that time can be more accurately measured by magnetostriction in quartz clocks, or by the vibration of ammonia molecules in so-called atomic clocks.

D. Navigation. *Tables (called ephemerides) giving the exact positions of the Sun, Moon, and

planets at any given time are compiled at observatories.

On the basis of these tables, sailors and aircraft pilots are able to calculate their position on the Earth's surface by observation of the heavenly bodies (5 338). The only instruments necessary are a sextant (5 338) and a chronometer (2 383).

BIOLOGY

THE most wonderful thing in the world is Life. Since the earliest days of civilized thought philosophers have wondered at its manifold problems and have sought in vain to penetrate its mysteries. What is life? What is that magic thing, possessed alike by the tiniest plant and the great genius among men, which serves to set them apart from the "dead" rock of the hillside? The scientist of to-day is perhaps very little nearer to a final definition of life than were the old Greek sages. Yet of the facts about life he knows vastly more. It is with these facts that **Biology** (1 447) deals. It was not until the beginning of the 19th century that Biology was organized definitely as a separate science. About that time the knowledge of botany and zoology, anatomy and physiology, had developed far enough to suggest to scientists that certain great principles must run through all forms of Life, a study which came to be called biology. In the **Nature Study Outline** (in this volume) some of the most interesting and significant facts about plants and animals are examined—without, however, emphasising any general biological laws. Here the scope of biology as a science, and some of the more important characteristics common to all forms of life, are surveyed.

I. THE SCOPE OF BIOLOGICAL SCIENCE.

A. Biology is the Science of All Life.

a. **Botany** (2 24)—Biology applied to Plant Life (6 214); **Zoology** (7 526) — Biology applied to the Animal Kingdom (1 154).

b. **Relations of Biology to Other Sciences.**

1. **Chemistry** (2-316) supplies data and methods for studying substances involved in life (food, tissues, fluids, such as blood and the sap of plants). An example is the chemistry of digestion (3 89). This aspect of chemistry is the chemistry of carbon compounds. **Biochemistry** (1 446, is the term used to describe the specific chemistry of life's processes.

2. **Physics** (6-185) supplies data and methods for studying the effects upon life of physical states and forces, such as light, heat, electricity, etc. For instance, physics helps to tell why sap rises.

3. **Geology** (3 515) assembles data concerning how the "life environment" that is, the earth's crust, the air, the waters of the earth—came to have its present form. It helps to trace the history of life by studying the age of fossils, and this study is often given a separate name—**Palaeontology**.

B. Chief Subdivisions of Biology.

a. **Cytology** deals with the composition and structure of cells (2-286), the basic units from which all living things are built; **Histology** deals with the manner in which these cells are organized into living tissues; **Anatomy** (1-143) investigates the arrangement of tissues into organs, and the arrangement of organs in the living organism.

b. **Embryology** (3-239) studies the development of individual organisms from the first

single cell; **Morphology** applies the principles of the foregoing branches to a study of the causes governing the structure and forms of all living organisms; **Physiology** (6 189) investigates and describes the functions of the parts of the organisms.

c. **Ecology** (3 158) deals with the relations of plants and animals to one another, to environment, effects of climate, etc.

d. **Genetics** (3-511) includes the study of the laws governing heredity in plants and animals, including Man. **Plant breeding** is an important development.

e. **Taxonomy** (1 151; 2 21) is the classification and naming of living things, closely linked with, and almost the same as, **Systematy**.

II. BIOLOGY'S TEACHINGS THE LIFE PROCESS.

A. Things Necessary to Life.

a. **Chemical Elements.** Of all those of which the earth is composed, 10 elements only, besides a number of so-called "trace-elements," are required by vegetable organisms. These are carbon, oxygen, hydrogen, nitrogen, iron, sulphur, phosphorus, potassium, magnesium, calcium; trace-elements include cobalt, copper, iodine, etc. (See articles on these elements.)

b. **Water.**

c. **Heat and Light.**

B. Combination of Matter into Life Forms.

a. **The Cell** (2 286) is the Combining Unit. The cell is the unit of all tissue. Many primitive plants and animals consist of single cells—**Amoeba** (1-140), **Yeast** (7-512). Higher

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forms start as single cells in the reproductive process and grow by cell division

b Chemical Nature of Cells Plant structures are stiffened primarily with cellulose (2 287) animal structures usually with compounds of calcium and silicon

c Basic Chemical and Physical Processes

1 Life materials are obtained from air, earth, and water by the process of "Photosynthesis" (6 182) This is the scientific name of the process by which plants with the aid of sunlight use their green colouring matter (chlorophyll) to extract carbon from the carbon dioxide of the air, and then combine that carbon with the minerals and water from the earth to manufacture the materials from which plant cells are built

2 Plants alone possess the chlorophyll necessary for photosynthesis. Animals live directly or indirectly on the food manufactured by plants

3 Many life processes are carried out through the actions of Enzymes (3 293, 2 323)

d Food Absorption and Conversion

1 Single celled animals and plants obtain their food by absorbing it through the cell walls. Many celled types usually have some kind of container into which food is drawn and held while being absorbed

2 Chemical nature of food conversion partly by chlorophyll in plants, by digestive ferments in animals

e Distribution of Food

1 Circulation of sap in higher plants

2 Circulation of blood in animals (1 489, 4 143 144)

f Respiration necessary to all Forms of Life (5 51, 4 469, 470, 6 215)

g Indirect Ways of obtaining Life Substances

1 Parasitism (6 77), living upon body material of another living organism. Typical parasites among plants—rusts and smuts (6 481). Usually accompanied by degeneration of the parasite

2 Saprophytism, living upon material of dead organisms (5 284 3 489). Mushrooms (5 301) are typical plant saprophytes

3 Symbiosis strictly a combination of two forms of life into a partnership each carrying on a separate share of the life process, as in Lichens (4 490). In many instances, only one organism may secure apparent benefit

h Disposal of used and waste Materials

1 By excretion

2 By respiration

3 By bacterial action

Organization of Life Processes

a Life Processes are carried out only through Individual Organisms. It is characteristic of all the phenomena of life that they are invariably found associated with individuals *functioning as units*. The parts of each unit are so co-ordinated that they act together toward a common end.

b Co-ordinating Mechanism of Plants Little is known of the forces which control this feature of plant life. The manner in which the various parts of a giant tree, for instance, communicate with one another so that each performs its proper part in relation to the whole tree is still a mystery. Evidence of delicate co-ordination in plants is well shown in the mechanism for fertilisation by insects (3 400), also in the Sensitive Plant (4 470)

c Co-ordinating Mechanism in Animals The very primitive types of animals, such as Sponges, present the same mystery in this respect as do plants. But, beginning with the jelly fish, there appears a distinct equipment definitely suited for the co-ordinating process—that is, a nervous system

1 Nerves and their work (5 368)

2 Nervous systems of higher animals culminate in Man's brain (1 150), the highest development of the co-ordinating mechanism. See also **Animal Behaviour** (1 151) **Migration** (5 202)

Note Both Animals and Plants react to light heat chemicals, et. by a series of *reflexes*, which some authorities think control all life. See **Reflexes** (4 469) **Migration** (5 202) **Plant Life** (6 214)

D Reproduction of Life

a Asexual Reproduction This consists of the production of one or more new organisms from a single organism. It may take place in one of the following ways

1 By Fission, or division into two approximately equal parts, as in Amoeba (1 140) and Bacteria (1 343)

2 By Budding, or the outgrowth of one or more new organisms which, sooner or later may be separated from the parent organism—Hydra (4 213) Sponges (7 137) Yeast (7-512) and some plants such as figwort

3 By Spore Formation (6 249)—that is, by the production of minute bodies usually consisting of a single cell which is liberated and can grow into a new organism. Ferns (3 346) and fungi (3 488) produce spores

b Sexual Reproduction (2 257) This consists of the union of two cells or **Gametes** (4 166). Often the two types of cells are found upon the same individual, as in most flowers

1 The male cell is called a sperm

2 The female cell is called an ovum or egg cell. In some instances *Parthenogenesis*, takes place, an unfertilised female being capable of producing young usually themselves infertile females, as in certain aphides (1 182) and in some sawflies

Note Many organisms reproduce by a process which combines the asexual and the sexual method, and this is termed alternation of generations. The process in plants consists of (1) the asexual production of a spore, (2) the growth of the spore into a "gametophyte" or sexual plant, (3) the sexual production by the gametophyte

of a "sporophyte" or non-sexual plant, which in turn produces spores again by the asexual process. Examples of this process are seen in Moss and Ferns (3-346). In some insects, such as Aphides (1-182), there is a different alternation of generations. This occurs also in many parasites.

E. Development of Life.

- a. Embryology (3-239).
- b. Egg (3-172 ; 1-460).
- c. Seeds and Spores (6-528).

III. HISTORY OF LIFE.

A. Evolution (3-321).

- a. Various Theories : Buffon (2-110) ; Darwin (3-51 ; 3-323) ; Later Theories (3-324).
- b. What Geology Tells of Evolution (5-104) ; the story of Fossils (3-425).
- c. Some Examples of Evolution : Horse (3-322 ; 4-196 ; 1-156) ; Elephant (3-227) ; Flatfish (3-377). Survival of primitive types : Marsupials (5-137) ; Opossum (5-521).

B. Heredity and What It Means (4-166).

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Classification of Plants

COUNTLESS difficulties confront botanists in the classification of plants and various writers differ widely in their arrangements. But such differences are not important to the general student. The classification below does not pretend to be complete, but includes only those groups which are either of scientific importance or can be readily studied. Students should begin by reading the general articles on Botany (2-24), Flowers (3-395), Leaves (4-469), Roots (6-451), Plant Life (6-214), Seeds and Spores (6-528), Trees (7-308). The main divisions in this classification of plants (4-515) are Phylum, Sub-phylum, Class, Order, Family, Genus. The phylum is indicated by a Roman numeral (I, II, III, etc.), the sub-phylum by "sub-ph.," and the others by the following abbreviations : Cl., Ord., Fam., Gen.

I. THALLOPHYTA.

Simplest plants, usually distinguished by having a "thallus," that is, a body which has no differentiated organs such as flowers, wood fibres, leaves, roots, etc. Forms range in size from the microscopic to the enormous, for example, the giant kelp (a seaweed). Most types reproduce by simple division or by spore formation, but higher types have primitive sexual characteristics. The simpler Thallophytes are frequently grouped together as Protophyta, equivalent to the Protozoa (6-298) of the Animal Kingdom. Among the classes of the Protophyta are many of those included among the Algae and placed there in the table below. Others, however, show features more akin to those of animals than plants, being for example motile ; these are sometimes called Flagellata. Among these simplest forms were the ancestors of all the higher plants.

Sub-ph. ALGAE (1-104). Includes those Thallophyta which contain chlorophyll.

Cl. Chlorophyceae : "Green Algae," simple one-celled forms and multicellular forms, with no colouring matter other than chlorophyll. Reproduction either sexual or asexual.

Ord. Volvocales : Single-celled plants capable of moving about with the aid of "cilia" or vibrating hair-like organs ; often classed as animals in the group Flagellata. Typical genera, *Volvox* (common species, *globator*), *Chlamydomonas*.

Ord. Protococcales : One- or many-celled motile or non-motile forms. Typical genera, *Pleurococcus*, Green Slime, often found in colonies on damp stones, tree trunks ;

Hydrodictyon, Water Net, forming net like colonies sometimes a foot long.

Ord. Ulotrichales : Simple unbranched filaments of many cells. *Ulothrix* is a common fresh-water genus.

Ord. Oedogoniales : Fresh-water filamentous forms. Typical genus, *Oedogonium*.

Ord. Ulvales : Thallus flat or tubular. Best-known genus, *Ulva*, Sea Lettuce.

Ord. Siphonales : Lack of cross-walls in body gives continuous cavity. Typical genus, *Vaucheria* (pond-scum, "green felt").

Ord. Conjugales : Forms a complex mass of fused tubes. Typical genus, *Spirogyra* (1-104), which consists of delicate filaments, found in pond-scum.

Cl. Characeae :

Ord. Charales : "Stoneworts" ; grow on bottom of ponds. Thallus has definite points from which branches and reproducing cells originate.

Cl. Rhodophyceae : "Red Algae" (1-105). Some have simple, others have very complicated structure. Sexual reproduction is highly developed.

Cl. Phaeophyceae : "Brown Algae" (1-104), the big seaweeds (6-526), chiefly marine. Includes Ord. Laminariales, the Kelps ; Ord. Fucales, the Bladder Wracks to which *Sargassum*, the gulf-weed, belongs.

Cl. Cyanophyceae : "Blue-green Algae" ; formerly placed in the Sub-phylum Schizomycetes, Cyanophyceae are now regarded as the most primitive class of Algae, and thus included in the Protophyta.

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Sub-ph. FUNGI (3-488). Parasitic and saprophytic forms, lacking chlorophyll. Consist of a mycelium of thread-like filaments (hyphae) which penetrate the food supply and also give rise to the spore-producing parts. Believed by some authorities to be degenerate forms of algae.

Cl. Phycomycetes : Hyphae have continuous cavity, cross-walls being formed only in connexion with reproduction. Includes false "mildews" and black moulds.

Cl. Ascomycetes : Hyphae divided by cross-walls; spores contained in sacs (asci). Includes morels, truffles, ergot, and true mildews and moulds; also the Yeasts.

Cl. Basidiomycetes : Spores borne on outgrowth from a cell, or row of cells, called a "basidium"; these are most of the common fungi, the mushrooms and toadstools. Typical examples, Rusts and Smuts, Mushrooms, Toadstools.

Note : The sub-phylum Myxomycetes or Slime Fungi are by some authorities included with the Fungi because they possess spore cases. They do not, however, have the mycelium. The young swarm-cells gather into amoeba-like groups, which leads some biologists to class them as animal.

Sub-ph. SCHIZOMYCETES : Bacteria (1-343). Usually classed with the Fungi. Reproduction by fission and by spores. Read also Germs in Disease (4-14).

Note : The Lichens (4-490) are partnership plants, consisting of a Fungus which imprisons algae, forming a combination that is mutually helpful. Lichens can be made artificially by placing the proper plants together. They are usually classified by means of the Fungus which enters into the combination. For instance, the genera *Parmelia* and *Physia* are *Ascolichenes*, because the Fungus is an Ascomycete.

II. BRYOPHYTA.

Probably evolved from Green Algae and adapted to land life. Characterised by well developed "alternation of generations" in which the gametophyte (plant of the sexual generation) is the commonly visible form.

Cl. Hepaticae : Liverworts (4-526), probably evolved from Algae and ancestors of Mosses; spore case opens by splitting or decay of walls.

Cl. Musci : Mosses (5-167); spore case opens by means of a lid or by slits; plant differentiated into primitive stems and leaves.

III. PTERIDOPHYTA.

This group is characterized by the appearance of a Vascular Structure, that is, a system of specialized cells for conducting sap through the plant body. A striking alternation of generations occurs, the familiar form being the sporophyte (the asexual generation). The gametophyte is a small, simple, green object. The best-known classes are :

Cl. Equisetales : The "Horsetails." The only living genus is *Equisetum*, stems jointed, leaves grow in whorls, being united in each whorl into a sheath.

Cl. Lycopodiales : Divided into various orders, the Lycopodiaceae or "Club mosses"

being the typical one. Stems slender, branched, closely covered with small leaves, moss-like in appearance.

Cl. Filicales : Ferns (3-346); fronds bear spores in "sori" or groups on their under surface. Two sub-classes: Filicineae, the true Ferns, such as *Pteris*, Bracken (2-37), and Hydropteridineae, the Water Ferns.

Note : In prehistoric times members of this and other primitive groups formed huge trees, the forests of their day.

IV. SPERMATOPHYTA.

Plants in which fertilisation results in the production of a seed, a resting embryo embedded in the food store. (In the preceding groups the fusion of the gametes does not result in a resting embryo.) There are two main sub-phyla: (1) Gymnosperms; (2) Angiosperms.

Note : Many of the less important families are omitted in the classification below.

Sub-ph. GYMNOSPERMS : "Naked-seeded" plants in which the seed is exposed to the air. This is a very ancient group, going far back in geological time, and showing evident descent from the ferns; its higher members, however, point the way to the Angiosperms. The extant classes are :

Cl. Cycadales : Primitive, fern-like or palm-like forms, confined to the tropics. The single stem bears a few large leaves. Typical genera, *Cycas* (Asiatic) and *Zamia* (American).

Cl. Ginkgoales : Sole surviving example, the Ginkgo or maidenhair tree.

Cl. Coniferales : Chief group, the conifers (2-483), found in temperate zones; tall, erect trees, usually evergreen with needle-like leaves.

Fam. Araucariaceae : Male and female cones similar, with numerous pointed scales. Typical genera *Araucaria*, Monkey Puzzle or Chili Pine (*f.-i.*); *Agathis*, Kauri Gum (5-422).

Fam. Podocarpaceae : Small trees and shrubs; cones small. An unimportant group.

Fam. Pinaceae : Trees and shrubs. Male cones superficially catkin-like; females consisting of overlapping scales, usually hard. Important genera: *Pinus*, Pines (6-203); *Abies*, Fir (3-355); *Picea*, Spruce (7-189); *Tsuga*, Hemlock tree (3-356); *Pseudotsuga*, Douglas Fir (3-356); *Larix*, Larch (3-421; 7-314); *Cedrus*, Cedar (2-285).

Fam. Cupressaceae : Scales fewer than in Pinaceae, leaves often of two types. Typical genera, *Cupressus*, Cypress (3-20); *Taxodium*, Deciduous or Swamp Cypress (2-483); *Juniperus* Juniper (4-386), in which cone-scales are amalgamated to form a berry-like fruit; *Wellingtonia* (7-437).

Fam. Taxaceae : Seeds often in fleshy capsules, or with naked ovules. Typical genus, *Taxus*, Yew (7-513).

Sub-ph. GNETALES (*f.-i.*). Plants intermediate between the later Coniferous orders and the Angiosperms, possibly the true ancestors of the latter. Examples, *Ephedra*, *Gnetum*.

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Sub-ph. **ANGIOSPERMS** (2-24; 6-214; 6-529).
The highest plants. Members of this group have true flowers; seeds are enclosed in seed case. Angiosperms fall into two great classes: (1) **Monocotyledons** and (2) **Dicotyledons**.

Note: The classification of Angiosperms depends chiefly upon the development of and variation in their flowers and, to a slight extent, their leaves. If the flowers, for example, have their parts arranged in a spiral, they are termed "spiral"; but in the higher groups they are often in a series of definite, separate whorls, and are then termed "cyclic." The number of families is very large and only important ones are given below.

Cl. Monocotyledons: Seeds have only one cotyledon; flowers with parts usually arranged in threes; vascular tissue usually scattered through the stems, which have no secondary thickening; leaves are mostly parallel-veined, the main veins being connected by finer veins, while in the leaves of the Dicotyledons there is usually one main vein sending branches to the margin.

Ord. Pandanales: Spiral flowers without perianth; all forms water-loving. Typical example: Fam. **Typhaceae**, Gen. *Typha*, Reed Mace (2-123).

Ord. Heliobieae: Water plants; usually cyclic flowers, often enclosed in a spathe.

Fam. Alismaceae: *Alisma*, Water Plantain; *Sagittaria*, Arrowhead (2-24); *Butomus*, Flowering Rush.

Ord. Glumales: Individual flowers protected by bracts or hairs.

Fam. Gramineae: Grass family (4 63), includes most cereal grains. Typical genera: *Avena*, Oats (5 490); *Triticum*, Wheat (7-447); *Secale*, Rye (6 482); *Oryza*, Rice (6-396); *Hordeum*, Barley (1-368); *Zea*, Maize (5 90); *Phragmites*, Reed; *Sorghum*; *Panicum*, Millet; *Bambusa*, Bamboo (1-359); *Saccharum*, Sugar-cane (7-183).

Fam. Cyperaceae: Sedges (*f.i.*). Distinguished from grasses by solid leaf-sheath enclosing stem. Typical genera: *Cyperus*, Papyrus Reed; *Carex*, Common Sedge.

Ord. Palmales: Consists of one family, **Palmaceae**, the Palms (6 50); rudimentary perianth present; flower cluster sheltered by great bract. Typical genera: *Phoenix*, Date Palm (6 50); *Areca*, Betel (5-487); *Cocos*, Coconut (2 441); *Metroxylon*, Sago Palm (6-484); *Phytelephas*, Ivory Palm.

Ord. Arales: Flowers with highly specialised type of bract; broad, net-veined leaves.

Fam. Araceae: Arums. Typical genera: *Arum*, Arum (3 339); *Richardia*, Arum Lily (4-507).

Fam. Lemnaceae: Duckweeds (7-429), leafless, whole plant resembling simple frond; form "carpets" on ponds.

Ord. Farinales: Flowers primitive, but often with differentiated calyx and corolla.

Fam. Commelinaceae: Spiderworts. Typical genus: *Tradescantia*, Spiderwort.

Fam. Bromeliaceae: Bromelia family; most types epiphytic; leaves often scaly. Typical genera: *Tillandsia*; *Ananas*, Pineapple (6-204).

Ord. Liliales: Perianth varies from primitive to petal-like type; root system often a bulb, rhizome, or corm (2-118).

Fam. Liliaceae: Floral elements set below ovaries (hypogynous); regarded as primitive family. Typical genera: *Lilium*, Lilies (4 506); *Allium*, Onion (5 511); Garlic, Leek; *Asparagus*, Asparagus (1-274); *Convallaria*, Lily of the Valley; *Tulipa*, Tulip (7-323); *Yucca*, Yucca; *Hyacinthus*, Hyacinth (4 213); *Ruscus*, Butcher's Broom (*f.i.*); *Scilla*, Bluebell (1 496).

Fam. Juncaceae: Rushes (*f.i.*). Flowers resemble lilies but are clustered; suited to wind pollination; leaves grasslike.

Fam. Dioscoreaceae: Tuber roots, climbing stems. Typical genus: *Dioscorea*, Yam (*f.i.*); *Tamus*, Black Bryony (*f.i.*).

Fam. Amaryllidaceae: Floral elements rise from top of ovary (epigynous). Typical genera: *Narcissus*, Narcissus (5 324), Daffodil (3 25); *Galanthus*, Snowdrop (7 78); *Agave*, Agave (1 67); *Sisal* (7 58).

Fam. Iridaceae: Iris family; most highly specialised family of order Liliales; flowers epigynous. Typical examples: *Iris*, Iris; *Gladiolus* (*f.i.*), *Crocus* (2 533); *Freesia* (*f.i.*).

Ord. Scitaminales: Flowers have petal-like stamens; leaf sheaths build up false stem.

Fam. Musaceae: Banana family. Typical genus: *Musa*, Banana (1 359).

Fam. Cannaceae or **Scitamineae**: Canna family. Typical example, Canna.

Fam. Zingiberaceae: Ginger family. Typical genera: *Zingiber*, Ginger (4 21, 7-131); *Maranta*, Arrowroot (*f.i.*).

Ord. Orchidales: Most highly specialised order of Monocotyledons.

Fam. Orchidaceae: Orchids (5 529), including "air plants" (epiphytes) and normal forms, the latter frequently saprophytic or parasitic. Most flowers have a well-developed labellum, or "lip." Typical genera: *Orchis*, including many of the best known species; *Ophrys*, insect-mimicking types, such as the bee and spider orchids; *Laelio cattleya*; *Cypripedium*, Lady's Slipper (4 436); *Vanilla*, Vanilla (7 381); *Spiranthes*, Lady's Tresses.

Cl. Dicotyledons: Plants whose seeds contain two cotyledons (6-528). Vascular tissue forms tube or cylinder including central pith; stems show secondary thickening; leaf veins usually end at edge of leaf; flowers have parts in fours or fives.

Note: The Dicotyledons fall into two sub-classes: (1) the **Archichlamydeae**, in which the flowers are either devoid of corolla (apetalous) or else they have one or several separate petals (polypetalous), and

(2) the *Sympetalae*, in which the petals are usually fused into a cup or tube at the base (sympetalous). The classification begins with the *Archichlamydeae*; only important families are mentioned.

Ord. *Piperales*: Primitive form; naked flowers. Typified by family *Piperaceae*, genus *Piper*, Pepper (6-121).

Ord. *Salicales*: The Willow order with one family; flowers grow on aments or "catkins," comprising numerous simple flowers, each concealed by a horny sheath or bract.

Fam. *Salicaceae*: Typical genera: *Salix*, Willow (7-454); *Populus*, Poplar (6-259).

Ord. *Juglandales*: The Walnut order, with one family. Flowers in catkins similar to those of willows, but show beginnings of petal and sepal structure; compound leaves.

Fam. *Juglandaceae*: Flowers monoecious. Typical genera: *Juglans*, Walnut (7-416); *Carya*, Hickory; Pecan.

Ord. *Fagales*: Flowers in catkins similar to those of the Walnut order, but leaves simple.

Fam. *Fagaceae*: Typical genera: *Fagus*, Beech (1-409); *Quercus*, Oak (5-489); *Castanea*, Spanish Chestnut (2-332).

Fam. *Betulaceae*: Typical genera: *Betula*, Birch (1-452); *Corylus*, Hazel (4-143); *Alnus*, Alder (1-97).

Ord. *Urticales*: Perianth distinct but bracteate instead of having true petals and sepals; flowers cyclic.

Fam. *Urticaceae*: Nettle family; alternate leaves. Typical genus: *Urtica*, Nettle (5-393). Fam. *Ulmaceae*: Elm family; alternate, simple leaves. Examples: *Ulmus*, Elm (3-236); *Celtis*, Lotus or Nettle tree. Fam. *Moraceae*: Mulberry family. Typical genera: *Morus*, Mulberry (5-289); *Cannabis*, Hemp (4-161); *Ficus*, Fig (3-350); *Banyan* (1-365); *Artocarpus*, Breadfruit (2-52); *Humulus*, Hop (4-192).

Note: All the catkin bearing plants are now often grouped together as *Amentiferae*.

Ord. *Santalales*: Flowers cyclic as in the Order *Urticales*, but calyx and corolla are differentiated.

Fam. *Santalaceae*: Typical genus: *Santalum*, Sandalwood.

Fam. *Loranthaceae*: Most members tropical and parasitic. Common example? *Viscum*, Mistletoe (5-228).

Ord. *Polygonales*: Flowers cyclic; perianth segments in threes.

Fam. *Polygonaceae*: The Dock family. Typical genera: *Polygonum*, Knotgrass; *Rumex*, Dock; *Rheum*, Rhubarb (6-396).

Ord. *Centrospermales*: Transitional forms ranging from bracteate flowers of *Chenopodiaceae* to well-differentiated perianth of *Caryophyllaceae*.

Fam. *Chenopodiaceae*: Goosefoot family. Typical genera: *Chenopodium*, Goosefoot; *Beta*, Beet (1-410).

Fam. *Caryophyllaceae*: Pinks; flowers well developed with calyx tending to fuse

into tube in some types. Typical genera: *Silene*, *Lychnis*, Campions (2-193); *Dianthus*, Pink (6-205); *Carnation* (2-244), Sweet William; *Stellaria*, Stitchwort (7-158), Chickweed (7-158).

Ord. *Ranales*: Ranges from primitive types with spiral flowers to well-developed cyclic flowers having true perianth.

Fam. *Ranunculaceae*: Crowfoot family. Typical genera: *Ranunculus*, Buttercup (2-135; 3-395); *Crowfoot*; *Delphinium*, Larkspur (4-448); *Paeonia*, Peony, (6-120); *Clematis*, Traveller's Joy (2-406); *Helleborus*, Hellebore, Christmas Rose (*f.i.*); *Aquilegia*, Columbine (*f.i.*); *Caltha*, Marsh Marigold; *Aconitum*, Monkshood (*f.i.*); *Anemone* (1-150).

Fam. *Berberidaceae*: Typical genus: *Berberis*, Barberry.

Fam. *Nymphaeaceae*: Typical genera: *Nuphar*, Yellow Water Lily; *Nymphaea*, White Water Lily; *Sacred Lotus* (7-425).

Fam. *Magnoliaceae*: Magnolia family. Typical genera: *Magnolia*, Magnolia (5-86); *Liriodendron*, Tulip Tree (*f.i.*).

Fam. *Myristicaceae*: Nutmeg family; tropical trees and shrubs. Typical genus: *Myristica*, Nutmeg (5-486).

Fam. *Lauraceae*: Laurel family. Typical genera: *Laurus*, Bay Laurel (4-455); *Cinnamomum*, Cinnamon (7-131); *Camphor* (2-192).

Ord. *Rhoeadales*: An advance on the *Ranales*.

Fam. *Papaveraceae*: The Poppy family, from which the other families may have evolved. Typical genus: *Papaver*, Poppy (6-259), Opium (5-521).

Fam. *Resedaceae*: Typical genus: *Reseda*, Mignonette (5-202).

Fam. *Cruciferae*: The Cabbage family (2-151). Typical genera: *Brassica*, Cabbage, Turnip, Mustard (5-312); *Raphanus*, Radish (2-151); *Nasturtium*, botanical name for Watercress (7-428); *Capsella*, Shepherd's Purse; *Iberis*, Candytuft (*f.i.*); *Cardamine*, Lady's Smock, Buttercress (2-24); *Cheiranthus*, Wallflower.

Ord. *Sarraceniales*: In this order are included several insect-eating plants.

Fam. *Sarraceniaceae*: American forms. Typical genus: *Sarracenia*, Pitcher Plants (6-207).

Fam. *Nepenthaceae*: Asiatic forms; pitchers at tip of tendrils. Typical genus: *Nepenthes*, Pitcher Plants (6-207).

Fam. *Droseraceae*: Leaves exude sticky fluid. Typical genera: *Drosera*, Sundew (7-190); *Dionaea*, Venus's Fly-Trap (7-389).

Ord. *Rosales*: This is the dominant order in the sub-class *Archichlamydeae*, with more than 14,000 species. The fruits are highly specialised in a large variety of forms. Types supposed to have evolved from Buttercup family, *Ranunculaceae*.

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Fam. Saxifragaceae : Most primitive types ; regarded as ancestors of other families in the order. Typical genera : *Saxifraga*, *Saxifraga* (6-501) ; *Hydrangea* (4-214) ; *Ribes*, Gooseberry (4-47), *Currant* (3-12).

Fam. Rosaceae : The Rose family. Typical genera : *Spiraea*, *Spiraea*, Meadow Sweet ; *Alchemilla*, Lady's mantle ; *Rosa*, Rose (6-453) ; *Fragaria*, Strawberry (7-173) ; *Potentilla*, Barren Strawberry ; *Rubus*, Raspberry (6-364) ; Blackberry (1-477) ; Loganberry (3-399) ; *Prunus*, Apricot (1-186), Sloe, Plum (6-228), Peach (6-99), Cherry (2-327), Cherry Laurel (4-455, 456) ; *Crataegus*, Hawthorn (4-142) ; *Pyrus*, now usually subdivided into *Pyrus* (Pear, 6-100), *Malus* (Apple, 1-185), *Sorbus* (Rowan, Service, Whitebeam (*f.i.*), 1-263) ; *Mespilus*, Medlar (6-325) ; *Amygdalus*, Almond (1-117) ; *Cydonia*, Quince (6-324).

Fam. Leguminosae : Pod-bearing plants ; roots often harbour nitrifying bacteria ; genus *Mimosa* is typical of the stock from which other types of Leguminosae evolved. This family is divided into three sub-families according to flower structure.

Sub-fam. Mimosoideae : Tropical and semi-tropical forms ; corolla regular. Typical genera : *Mimosa*, *Mimosa*, Sensitive Plant (4-470) ; *Acacia*, *Acacia* (1-8).

Sub-fam. Caesalpinioidae : Flower partially "papilionaceous" (butterfly-shaped). Typical genera : *Gloditschia*, Honey Locust ; *Tamarindus*, Tamarind (3-479) ; *Cercis*, Judas Tree (*f.i.*).

Sub-fam. Papilionoidae : Flower completely papilionaceous. Typical genera : *Phaseolus*, Bean (1-390) ; *Glycine*, Soya Bean (7-103) ; *Pisum*, Pea (6-99) ; *Lathyrus*, Sweet Pea (6-99) ; *Lens*, Lentil (4-482) ; *Arachis*, Groundnut (4-98) ; *Trifolium*, Clover (2-423), Shamrock (7-15) ; *Melilotus*, Sweet Clover (2-423) ; *Medicago*, Lucerne (5-48) ; *Astragalus*, Milk Vetch, Tragacanth ; *Glycyrrhiza*, Liquorice (4-521) ; *Lotus*, Bird's-foot Trefoil (5-40) ; *Robinia*, Locust, False Acacia ; *Indigofera*, Indigo (5-256) ; *Haematoxylon*, Logwood (*f.i.*).

Fam. Platanaceae : Typical genus : *Platanus*, Plane Tree (6-211).

Fam. Hamamelidaceae : Typical genus : *Hamamelis*, Witch-hazel (*f.i.*).

Ord. Geraniales : Flowers completely cyclic ; carpels tend to fuse into "compound pistils" in higher families.

Fam. Geraniaceae : Geranium family (3-524). Typical genera : *Pelargonium*, so-called "Geranium" ; *Geranium*, true Geranium.

Fam. Tropaeolaceae : Typical genus : *Tropaeolum*, commonly called Nasturtium (5-324).

Fam. Linaceae : Type : *Linum*, Flax (3-387).

Fam. Meliaceae : Typical genus : *Swietenia*, Mahogany (5-87).

Fam. Euphorbiaceae : Spurge family. Typical genera : *Euphorbia*, Spurge (*f.i.*) ; *Ricinus*, Castor Bean ; *Hevea*, Para Rubber (6-464) ; *Manihot*, Cassava, the source of Tapioca (7-226).

Fam. Oxalidaceae : Typical genus : *Oxalis*, Oxalis, Wood Sorrel.

Fam. Rutaceae : Typical genus : *Citrus*, Orange (5-524), Lemon (4-477) ; Lime, Grapefruit (4-61).

Ord. Sapindales : Flower forms similar to Geraniales ; distinguished by structure of ovules.

Fam. Hippocastanaceae : Typical genus : *Aesculus*, Horse Chestnut (4-197) (by some this family is called Sapindaceae).

Fam. Anacardiaceae : Typical genera : *Rhus*, Sumach, Lacquer (4-434) ; *Mangifera*, Mango (5-113).

Fam. Aceraceae : Maple family. Typical genus : *Acer*, Maple (5-117), Sycamore (7-215).

Fam. Buxaceae : Type : *Buxus*, Box (*f.i.*).

Fam. Aquifoliaceae : Typical genus : *Ilex*, Holly (4-187).

Ord. Rhamnales : Flowers tetra-cyclic, that is, the parts of the perianth arise from four distinct circles or whorls. Otherwise order resembles Sapindales.

Fam. Rhamnaceae : Buckthorn family. Typical genus : *Rhamnus*, Buckthorn (*f.i.*).

Fam. Vitaceae : Shrubs, climbing vines. Typical genera : *Vitis*, Grape Vine (4-62) ; *Ampelopsis*, Virginia Creeper.

Ord. Malvales : Most types have carpels fused into compound pistil (syncarpous).

Fam. Malvaceae : Mallow family ; stamens fused into tube around pistil. Typical genera : *Malva*, Mallow (5-97) ; *Gossypium*, Cotton (2-516) ; *Althaea*, Hollyhock (4-187) ; *Eriodendron*, Kapok tree (4-393).

Fam. Tiliaceae : Lime family ; carpels fused ; stamen form variable. Typical genera : *Tilia*, Lime Tree (4-509) ; *Corchorus*, Jute (4-389).

Fam. Bombacaceae : Silk cottons ; seeds covered with silky hairs. Typical genus : *Adansonia*, Baobab.

Fam. Sterculiaceae : Cola nut family ; flowers often have stamens fused. Typical genera : *Sterculia*, Bottle tree (2-26) ; *Theobroma*, Cacao (2-438).

Ord. Parietales : Complex group showing marked relation to Ranales.

Fam. Passifloraceae : Typical genus : *Passiflora*, Passion Flower.

Fam. Begoniaceae : Typical genus : *Begonia*, Begonia (1-416).

Fam. Theaceae : the Tea family. Typical genera : *Thea*, Tea (7-232) ; *Camellia*, Camellia (2-189).

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Fam. **Violaceae** : Violet family. Typical genus : *Viola*, Violet (7-401), Pansy (6-80).

Ord. **Opuntiales** : The Cactus order (2-157). Contains one family, **Cactaceae**. Typical genera : *Cereus*, *Opuntia*, *Echinocactus*.

Ord. **Myrtales** : Stamens always cyclic; some perigynous, some epigynous.

Fam. **Myrtaceae** : Myrtle family. Typical genera : *Myrtus*, Myrtle; *Eucalyptus*, Eucalyptus (3-309); *Eugenia*, Pimento and Clove (2-423).

Fam. **Onagraceae** : Typical genera : *Epi-lobium*, Willow-herb (*f.i.*; 3-399 illus.); *Fuchsia*, Fuchsia (3-485).

Fam. **Punicaceae** : Typical genus : *Punica*, Pomegranate (6-256).

Fam. **Rhizophoraceae** : Typical genus : *Rhizophora*, Mangrove (5-113).

Ord. **Umbellales** : Most highly developed forms in the sub-class **Archichlamydeae**. Stamens always cyclic. Flowers epigynous.

Fam. **Araliaceae** : Typical genus : *Hedera*, Ivy (4-332).

Fam. **Cornaceae** : Typical genus : *Cornus*, Dogwood (*f.i.*).

Fam. **Umbelliferae** : The Parsley family; flowers usually very small and numerous, in umbrella-shaped clusters (umbels). Typical genera : *Apium*, Celery (2-286); *Peucedanum*, Parsnip (6-93); *Daucus*, Carrot (*f.i.*); *Conium*, Hemlock (poisonous herb) (4-161).

Note : This point marks the end of the sub-class **Archichlamydeae** and the beginning of the sub-class **Sympetalae**, in which the petals are fused into a more or less tubular corolla.

Ord. **Ericales** : Most primitive of **Sympetalae**.

Fam. **Ericaceae** : Heath family (*f.i.*). Typical genera : *Erica*, Heath (4-148), *Calluna*, Heather (4-148); *Vaccinium*, Cranberry, Bilberry (1-445); *Azalea* (1-330); *Arbutus*, Strawberry Tree (1-201); *Rhododendron* (6-395).

Ord. **Primulales** : Single cycle of stamens, opposite petals; seed-supporting structure "free" inside ovary.

Fam. **Primulaceae** : Primrose family. Typical genera : *Primula*, Primrose (6-287), Cowslip (2-523); *Lysimachia*, Yellow Loosestrife, Pimpernel (Poor Man's Weather Glass) (*f.i.*); *Cyclamen* (*f.i.*).

Ord. **Ebenales** : Members show both primitive polypetalous forms and advanced epigynous characteristics.

Fam. **Ebenaceae** : Ebony family. Typical genus : *Diospyros*, Ebony (3-156), Persimmon.

Fam. **Sapotaceae** : Sapodilla family. Typical genera : *Chrysophyllum*, Star Apple (3-479); *Sapota*, Sapodilla; *Palaquium*, Gutta-percha Tree (4-108).

Ord. **Gentianales** : Flowers stable in type, usually with five petals and stamens, and two carpels; corolla twisted in bud.

Fam. **Gentianaceae** : Gentian family. Typical genus : *Gentiana*, Gentian (3-513).

Fam. **Oleaceae** : Olive family; leaves often leathery; some types produce flowers in clusters. Typical genera : *Olea*, Olive (5-507); *Ligustrum*, Privet; *Syringa*, Lilac (4-506); *Jasminum*, Jasmine (4-354); *Fraxinus*, Ash (1-263).

Fam. **Loganiaceae** : Typical genera : *Strychnos*, *S. nuxvomica*; *Gelsemium*, Yellow or Carolina Jasmine.

Fam. **Apocynaceae** : Dogbane or Periwinkle family. Highly evolved, except that carpels are distinct. Typical genera : *Nerium*, Oleander; *Vinca*, Periwinkle.

Ord. **Polemoniales** : Flowers symmetrical with several planes of symmetry.

Fam. **Polemoniaceae** : Typical genus : *Phlox* (6-160).

Fam. **Convolvulaceae** : Twining, climbing plants. Typical genera : *Ipomoea*, Morning Glory; *Convolvulus* (2-494); *Cuscuta*, Dodder (5-444).

Ord. **Boraginales** : Types tend to evolve lobed ovary, resulting in four-part form.

Fam. **Boraginaceae** : Borage family; members usually have hairy stems. Typical genera : *Myosotis*, Forget-me-not (3-422); *Heliotropium*, Heliotrope (*f.i.*).

Ord. **Labiatales** : Flower forms tend to develop about one axis of symmetry.

Fam. **Lentibulariaceae** : Insect-eating, marsh-loving plants. Typical genera : *Utricularia*, Bladderwort (6-218, 217 illus.); *Pinguicula*, Butterwort (5-444; 6-218 illus.).

Fam. **Verbenaceae** : The more primitive forms. Typical genera : *Verbena*; *Tectona*, Teak (7-235).

Fam. **Labiatae** : Most of the garden herbs belong to this family (7-272). Typical genera : *Mentha*, Mint (5-222); *Nepeta*, Ground Ivy (*f.i.*); *Lamium*, Dead Nettle (5-393); *Thymus*, Thyme (7-272); *Lavandula*, Lavender (4-456).

Ord. **Personales** : Flowers highly zygomorphic (developed about one axis of symmetry).

Fam. **Solanaceae** : Nightshade (5-439) family; members frequently poisonous. Typical genera : *Solanum*, Nightshade, Potato (6-273), Bittersweet (1-477); *Nicotiana*, Tobacco (7-286); *Capsicum*, Cayenne Pepper (6-121); *Atropa*, *Atropine*, Belladonna, or Deadly Nightshade (5-439; 6-236); *Petunia*, Petunia; *Lycopersicum*, Tomato (7-290).

Fam. **Bignoniaceae** : Trees and woody climbers; flowers often irregular. Typical genus : *Catalpa*, Catalpa, Indian Bean.

Fam. **Scrophulariaceae** : Figwort family; fruit two-celled, many-seeded capsule. Contains more than 2,000 species. Typical examples : *Linaria*, Toadflax (*f.i.*); *Digitalis*, Foxglove; *Calceolaria*; *Scrophularia*, Figwort (*f.i.*); *Verbascum*, Mullein (*f.i.*).

Fam. **Orobanchaceae** : Brown or whitish, leafless, parasitic plants, flowers lipped. Typical genera : *Orobanche*, Broomrape; *Lathraea*, Toothwort.

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Ord. Rubiales : Anthers usually distinct ; flowers epigynous.

Fam. Rubiaceae : Madder family ; opposite or whorled leaves with interposed stipules. Typical genera : *Cinchona*, Quinine (6-325) ; *Coffea*, Coffee (2 444) ; *Gardenia*, Gardenia (*f.i.*).

Fam. Caprifoliaceae : Honeysuckle family ; flat-topped flower clusters. Typical genera : *Sambucus*, Elder (3 207) ; *Lonicera*, Honeysuckle (4 190).

Fam. Dipsacaceae : Typical genera : *Dipsacus*, Teasel (7 235) ; *Scabiosa*, Scabious (*f.i.*).

Ord. Campanulales : Contains highest forms of Angiospermus. Anthers often converge or fuse ; more than 14,500 species in order.

Fam. Campanulaceae : Primitive stock of this order. Typical genus : *Campanula*, Harebell (1 494 ; 2 24 illus.) ; Canterbury Bell (*f.i.*), Bellflower (*f.i.*).

Fam. Cucurbitaceae : The Gourd and Melon family. Typical genera : *Cucurbita*, Marrow (5-135), Squash, Pumpkin (6-307) ; *Cucumis*, Musk Melon, Cantaloup (5-167), Cucumber (3-9) ; *Citrullus*, Water Melon (5-167) ; *Lagenaria*, Gourds (*f.i.*) ; *Bryonia*, Bryony (*f.i.*).

Note : The family Cucurbitaceae is sometimes placed in a separate order, Cucurbitales.

Fam. Compositae : The Compositae, dominant and most highly evolved family of plants, contain more than 12,500 species. Characterised by "compound" inflorescences ; seeds usually wind-borne on "parachute." Regarded as the highest type known. Typical genera : Aster (1-277) ; Chrysanthemum (2 384) ; *Helianthus*, Jerusalem Artichoke (1-257), Sunflower (7 190) ; *Taraxacum*, Dandelion (3 40) ; *Lactuca*, Lettuce (*f.i.*) ; *Cichorium*, Chicory (*f.i.*) and Endive (*f.i.*) ; *Dahlia*, Dahlia (3 25) ; *Carlus* and *Oniscus*, Thistles (7 270) ; *Tussilago*, Colt's-foot (*f.i.*) ; *Bellis*, Daisy (3 27) ; *Anthemis*, Camomile (2 190) ; *Calendula*, Marigold (5 126) ; *Centaurea*, Cornflower (2 507), Knapweed ; *Cynara*, Globe Artichoke (1-257). The Compositae are often divided into *Tubuliflorae*, which have a composite floral head made up of small tubular flowers usually surrounded by large "ray" flowers, with conspicuous pappus, and *Liguliflorae*, whose floral head is composed entirely of ray flowers.

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It is not possible to draw a sharp line of distinction between physics and chemistry ; but in the main those properties and processes which are explained by the arrangement and rearrangement of atoms in molecules are considered as belonging to chemistry ; the rest to physics. A considerable area common to both subjects is sometimes referred to as physical chemistry.

I. GENERAL PRINCIPLES.

A. Basic Conceptions and Definitions.

a. Elements. Those substances which, it has been found by long experience, cannot be broken down into simpler substances are called elements (2-316). There are at least ninety natural elements ; and at least eight more which have been made artificially (3-224).

b. Atoms. All atoms of any given element have the same number of protons in the nucleus, and when complete an equal number of electrons surrounding it (1-298). On these electrons, and more particularly those in the outer shell, the chemical properties of the elements depend (2-318).

c. Molecules. Groups of atoms tend to cling together as molecules (2-317). A substance whose molecules are all alike is called a pure substance, and if there is more than one kind of atom in the molecules, it is a chemical compound.

d. Isomers. Substances whose molecules contain the same kinds of atoms in the same numbers, but differ only in their arrangement, are called chemical isomers (2-321).

e. Radicles. Groups of atoms which during chemical changes appear to pass from one molecule to another unaltered, almost as though they were single atoms, are called radicles or radicals. In practice it is rare (though not impossible) to find a radicle existing by itself : it is almost always found in combination (2 318).

f. Valency. The basic principles of molecular arrangement are embodied in the theory of valency. In its early form the valency of an atom was defined as its capacity to combine with other atoms, and pictured as a set of hooks engaging one to one with similar hooks on other atoms. Later, valency was explained in terms of the electrons in the outer shell (called the valency electrons) (2 317).

g. Bonds. Three types of bonds binding atoms together in molecules and crystals are distinguished : polar, ionic, or electrovalent bonds ; covalent bonds ; and co-ordinate linkages. In some circumstances double or even triple bonds may be formed between two atoms (2 318).

h. Shapes of Molecules. In general the bonds to any atom tend to keep as far away from each other as possible. This, with the relative

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sizes of the atoms concerned, determines the shape of the molecule; and the shape of the molecule determines many of the physical properties of the substance (2 318)

i Mixtures Chemical compounds are distinguished from mechanical mixtures in which small grains or even molecules of different substances are jumbled together, the molecules themselves remaining distinct. Thus a mixture of oxygen and hydrogen gas differs greatly from the chemical compound water (7 424).

j Colloids When very small particles of one substance are distributed evenly through a fluid medium the result is a colloid, which has special properties different from those of an ordinary solid, liquid, or gas (2 455)

k Solutions In a solution, the individual molecules of one substance, the solute, are distributed evenly through a medium which is usually liquid and is called the solvent (2 322). There are also solid solutions, chiefly important in metallurgy (1 119)

l Electrolytes In many liquid solutions some or all of the molecules of the solute split up into two parts in such a way that one has more, the other less, than its normal complement of electrons. Each part thus carries an electric charge and is called an ion (4 276). The process is called dissociation, and the substances which dissociate in solution are called electrolytes (3 220)

B Analysis and Synthesis These represent the two departments into which both organic and inorganic chemistry can be divided in practice. **Analysis** is the breaking down of given substances to discover what elements they contain (qualitative analysis) and in what proportions (quantitative analysis). **Synthesis** is the building up of required substances out of simpler materials. Chemicals which are themselves made by synthesis but are chiefly used as starting points for the synthesis of even more complicated materials are called intermediates (2 324)

C Chemical Reactions A chemical reaction occurs whenever the atoms in the molecules of one or more substances become rearranged. The original molecules may be split up, or two or more may join together, or any combination of these two processes may occur (2 322). Well-known examples are burning or combustion (3 357), the reaction of an acid with either a base or a metal to form a salt (1 11). Chemical reactions take place more readily when one or more of the substances concerned are in liquid or gaseous form. They can also be promoted by heat, light, electricity, and other forms of energy (2 322)

a. Conservation of Mass In any chemical reaction, the total mass of the substances produced will equal the total mass of the ingredients (2 317)

b. Conservation of Energy In general, a chemical reaction will either release or absorb energy—usually in the form of heat, some

times of light, electricity, etc. In every reaction the amount of heat or other energy absorbed or emitted will be exactly balanced by the amount of chemical energy gained or lost (2 323). A great deal has been learned about chemical reactions by applying in detail the principles of thermodynamics to the energy changes involved (2 324)

c Catalysts Many chemical reactions are assisted by the presence of other substances, called catalysts. These remain unaltered however long the reaction continues. They make no difference to the energy balance, but they enable the reaction to take place much more quickly. They are of great importance both in the chemical industry, and in the functioning of living organisms (2 322)

D The Language of Chemistry

a Symbols and Formulae Every element has a symbol which is either a single capital letter or one capital and one small letter. In the (molecular) formula for any compound, the number of atoms of each element in the molecule is written as a subscript after its symbol, e.g. Sugar ($C_{12}H_{22}O_{11}$) (2 317). Graphic and structural formulae are more elaborate indications of the arrangement of the atoms in space (2 319)

b Equations Chemical equations are a device for representing reactions simply on paper. They enable each letter to be made to see that the same atoms are represented on both sides of the arrow, in accordance with the conservation of matter (1 11)

c Nomenclature In the name of a compound containing only two elements, the name of the more electropositive is placed first, the other following with the suffix *-ide*, e.g. sodium chloride $NaCl$ (6 490). Where two or more such compounds exist they may be distinguished by Greek numerical prefixes, e.g. carbon monoxide (CO) (2 220), carbon dioxide (CO_2) (2 219), boron trichloride BCl_3 (2 319), carbon tetrachloride CCl_4 (used for cleaning clothes and more generally as an industrial solvent), phosphorus pentoxide P_2O_5 (used for drying gases), uranium hexafluoride UF_6 (used in the separation of uranium 235 from uranium 238). The suffix *-ate* indicates the presence also of oxygen in the compound, e.g. sodium carbonate or washing soda Na_2CO_3 (1 111), sodium chlorate $NaClO_3$ (a powerful weed killer). Where there are two such compounds the one with less oxygen is distinguished by the suffix *-ite*, e.g. potassium sulphate K_2SO_4 , potassium sulphite K_2SO_3 . Where metals have more than one valency, compounds resulting from the higher valency are distinguished by the suffix *-ic*, those resulting from the lower valency by the suffix *-ous*, e.g. ferric oxide (the pigment), FeO_3 , ferrous oxide FeO , mercuric chloride or corrosive sublimate $HgCl_2$, mercurous chloride or calomel, $HgCl$.

In organic chemistry the names of hydrocarbons in the paraffin series usually end in

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-ane, of olefins in -ene, of acetylenes in -yne, of saturated aromatic hydrocarbons in -ene; alcohols often end in -ol, aldehydes in -al, ketones in -one, radicals in -yl, etc. The prefixes *n*- (for *normal*), *iso*-, and *neo*- in aliphatic compounds indicate straight, single-branched, and double-branched chains respectively.

II. PHYSICAL CHEMISTRY.

A. States of Matter. These are usually given as solid, liquid, and gas, though colloids are sometimes taken as constituting a fourth state. See Study-Outline of Physics and references there.

a. Gas Laws. These are dealt with in the Physics Study Outline, and in the article on Gases (3-508).

b. Critical Temperature. For every gas there is a critical temperature below which the gas can be liquefied merely by pressure, but above which no amount of mere pressure will produce liquefaction. A gas below its critical temperature is, strictly speaking, a vapour.

c. Vapour Pressure. All liquids with a free surface will give off a small amount of vapour. If they are in an enclosed space, evaporation will continue till the vapour reaches a certain pressure, which is characteristic of the liquid at any given temperature and increases with temperature. When the vapour pressure of an unenclosed liquid becomes greater than atmospheric pressure, the liquid boils.

d. Phase Rule. In mixtures of solids, liquids, and gases, a phase is defined as any part of the system which is homogeneous in itself and separated off from any other part; the components of the system are the chemically distinct substances of which it is composed. Thus, in a mixture of ice and water there is one component (H_2O), but two phases; in a mixture of oxygen and nitrogen there is one phase (gaseous), but two components.

The phase rule, first enunciated by the American mathematical physicist J. Willard Gibbs in 1876, states that in a system with P phases and C components, $P + F = C + 2$, where F is the number of degrees of freedom, i.e. the number of factors (temperature, pressure, concentration, etc.) that can be varied independently without altering the number of phases. This rule has very wide applications and is of immense importance in metallurgy for predicting the structure of alloys, and in the chemical industry generally.

B. Atomic and Molecular Weights.

a. Atomic Weight. The weights of atoms of different elements were first determined in terms of an atom of hydrogen which was taken as 1. Later it was found more convenient to determine atomic weights by reference to oxygen, the average weight of 1 atom of oxygen being taken as exactly 16. On this scale (called the chemical scale) the weight of a hydrogen atom works out at 1.0080; atomic weights on this scale for all except the rarest elements were agreed by an

international committee in 1941 and 1948 and are given in the Periodic Table (3-224).

With the discovery that ordinary oxygen, though consisting chiefly of atoms with a mass number of 16, has nevertheless 0.2 per cent of atoms with mass number 18, a new scale called the physical scale has been introduced in which pure oxygen-16 is taken as having an atomic weight of 16. On this scale the mean atomic weight of natural hydrogen is 1.0088; of pure hydrogen without deuterium, 1.0081.

b. Molecular Weight. This is the sum of the atomic weights of all atoms in a molecule (chemical scale).

III. INORGANIC CHEMISTRY.

A. Periodic Table. If the elements are arranged in order of their atomic weights, a similarity of chemical properties turns up at regular intervals, or periods, down the list. Thus a table can be devised in which elements with similar properties fall under each other in columns or groups. One form of this table is given in 3-224. In other forms the transition elements are doubled up under the main groups, so that the column headed by scandium is reckoned a sub-group of group 3, those headed by titanium, vanadium, chromium, manganese, copper, and zinc of groups 4, 5, 6, 7, 1, and 2 respectively. This leaves only the three columns headed by iron, cobalt, and nickel as transition elements either under group 0 or forming a new group 8.

a. Group 0 contains the inert gases helium (4-160), neon (5-366), argon, krypton, xenon, and radon (6-357). These have their outer shell of electrons complete with 2 (helium) or 8 electrons. They have thus no valency electrons, and are almost incapable of chemical combination.

b. Group 1 contains the alkali metals lithium, sodium (7-82), potassium (6-272), rubidium, caesium, and francium in one sub-group; and the coinage metals copper (2-502), silver (7-56), and gold (4-38) in the other. The former combine readily with oxygen and tarnish quickly, the latter are comparatively resistant in air. All have one electron in the outer shell and valency 1.

c. Group 2 contains the alkali earth metals beryllium, magnesium (5-81), calcium (2-166), strontium, barium (7-507), and radium (6-352) in one sub-group; zinc (7-523), cadmium (3-224), and mercury (5-173) in the other. They all have two electrons in the outer shell and valency 2; but mercury forms two series of salts, the mercurous salts with valency 2 and the mercuric salts with valency 1.

d. Group 3 contains the non-metal boron, besides aluminium (1-127), gallium, indium, and thallium in one sub-group; and scandium, yttrium, the "rare earth" metals or lanthanides (7-259), and actinium in the other. They have three electrons in the outer shell and the valency is usually (but not always) 3.

e. Group 4 contains carbon (2-219) and silicon (7-53), which are non-metals, germanium

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(2-226), tin (7-280), and lead (4-463) in one sub-group; titanium (7-282), zirconium (7-523), and hafnium in the other. There are four electrons in the outer shell and the valency is usually 4, though sometimes 2.

f. Group 5 contains nitrogen (5-443) and phosphorus (6-162), which are non-metals, arsenic (6-236), which is on the border line, antimony (1-175), and bismuth (1-475) in one sub-group; vanadium (7-378), niobium (7-224), and tantalum (7-224) in the other. They have five electrons in the outer shell and the valency is 3 or 5.

g. Group 6 contains oxygen (6-22) and sulphur (7-186), which are non-metals, the semi-metal selenium (6-530), and the metals tellurium (7-255) and polonium (6-351) in one sub-group; chromium (2-382), molybdenum, and tungsten (7-324) in the other. There are six electrons in the outer shell; the valency is occasionally 6, frequently 2, sometimes 3 or 4.

h. Group 7 contains the halogens (4-120) fluorine, chlorine (2-377), bromine, iodine, and astatine in one sub-group; manganese (5-112), technetium and rhenium in the other. There are seven electrons in the outer shell; the valency is usually 1, though it can be anything up to 7.

i. Group 8 contains three triads of transitional metals: iron (4-288), cobalt (2-434) and nickel (5-432); ruthenium, rhodium, and palladium; osmium, iridium, and platinum (6-221). The last six are often lumped together as the platinum metals. Valencies vary from 1 to 8, but 2, 3, 4, and 6 are the most common.

j. Hydrogen. Since hydrogen has one electron in its outer shell, it is sometimes included in group 1. Since, however, the first shell round the nucleus is complete with two electrons, hydrogen has one electron short of a complete outer shell, and from this point of view has affinities with group 7. It is non-metallic with a valency of 1 (4-221).

k. Actinides. It is thought that the artificial trans-uranian elements, neptunium, plutonium, americium, curium, berkelium, and californium, probably belong to a second "rare earth" group, though there is some doubt about where this group begins. (On the assumption that like the lanthanides all its members have three electrons in the outer shell, they are sometimes referred to as actinides, and taken as including also thorium, protactinium, and uranium (7-870).

B. Types of Compound.

a. Acids. A large class of chemical substances usually sour to the taste (Lat. *acidus*, sharp) and tending to corrode metals. Defined technically as substances which when dissolved release hydrogen ions (1-11). The strength of an acid (pH) is measured in terms of the concentration of hydrogen ions (1-12). Well-known inorganic acids are:

hydrochloric acid (4-215), nitric acid (5-442), and sulphuric acid (7-187).

b. Bases. These can be defined as substances which when dissolved release hydroxyl ions. The large majority are oxides or hydroxides of alkaline or alkaline earth metals, but the metal may be replaced by a radicle (1-12).

c. Alkalis. The term alkali is loosely applied to certain common bases, of which soda, potash, and ammonia are best known (1-111).

d. Salts. Substances formed by reaction of a base or a metal with an acid so that one or more free hydrogen atoms of the acid are replaced by a metal or a basic radicle (1-11).

IV. ORGANIC CHEMISTRY.

This branch began as the study of those chemical compounds (called organic compounds) which go to make up living tissues or which are produced by living processes. In such compounds the molecules are built on a skeleton of carbon atoms, which join up with themselves in an enormous variety of elaborate patterns. Since the discovery that organic compounds could be made artificially, organic chemistry is no longer confined to living processes and products. On the one hand a large branch is concerned with the synthesis of oils, drugs, dyes, plastics, etc., from simple (often inorganic) materials; on the other hand a branch more intimately concerned with the chemical changes accompanying biological processes has been separated off under the name of biochemistry.

A. Organic Molecules.

a. Chains and Rings. Aliphatic compounds have the carbon atoms strung in open chains, and these may be either branched or unbranched. Cyclic compounds have the carbon atoms arranged in rings. In aromatic compounds the ring (called the benzene ring) has six carbon atoms sharing nine bonds, which thus occupy 18 out of the available 24 valency electrons (2-319). In alicyclic compounds there are fewer than nine bonds distributed round the ring and the properties are more aliphatic than aromatic. Polycyclic compounds have more than one ring condensed into a network. In heterocyclic compounds, one or more of the carbon atoms in the skeleton may be replaced by some other element (e.g. nitrogen, oxygen, sulphur). This frequently leads to five-atom instead of six-atom rings. Four-atom rings, and rings with more than six atoms, are also known. Many of the substances found in plant and animal tissues have molecules of extremely complicated structure (2-321), the most complicated of all being the proteins on which all living processes seem to depend (6-297).

b. Hydrocarbons. The basic patterns are seen most clearly in the hydrocarbons, which have only hydrogen atoms attached to the carbon skeleton.

Aliphatic hydrocarbons include the paraffin series, $C_n H_{2n+2}$; the olefin series, $C_n H_{2n}$; and the acetylene series, $C_n H_{2n-2}$.

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Aromatic hydrocarbons include benzene C_6H_6 , with one ring; naphthalene, $C_{10}H_8$, with two rings; anthracene, $C_{14}H_{10}$, with three rings, etc. (2 319).

c. **Carbohydrates.** These are compounds of carbon, hydrogen, and oxygen only, and include the sugars (7-183), starch (7-149), and cellulose (2 287).

B. Organic Reactions.

a. **Substitution.** This, in theory at least, is the most important of all organic reactions. It involves the replacement of one or more atoms in the basic hydrocarbon pattern by other atoms or groups of atoms. The process gives rise to such whole classes of organic compounds as alcohols, aldehydes, acids, esters, ketones, phenols, amines, amides (2 321).

b. **Oxidation.** Adding oxygen to a molecule, together with any further changes which take place in consequence. Adding chlorine or removing hydrogen may be counted as equivalent.

c. **Reduction.** The opposite of oxidation, which may be brought about by removing

oxygen, by adding hydrogen, and by other means. Hydrogenation is reduction by direct union with gaseous hydrogen (4-222).

d. **Condensation.** The joining of two molecules together with the elimination of some simpler substance (e.g. water or alcohol) in the process.

e. **Polymerisation.** Making comparatively small molecules join up with themselves to produce large chains or networks, as in the manufacture of plastics (6 219).

V. CHEMICAL INDUSTRIES.

These include the heavy chemical industries producing alkalis (2 324), lime (4 508), and cement (2 288), sulphuric acid (7 187), hydrochloric acid (4 215), chlorine (2 377), etc., the newer large-scale chemical industries producing synthetic ammonia (1 140), nitric acid (5 422), nitrates (5 444), and explosives (3 328); petroleum refining and the production of petroleum chemicals (6 147), fine chemicals, including dyes (3 141), drugs (3 127), and other coal-tar products (2 433); distilling (3 94); the manufacture of soap (7 78), fats (5 506), waxes (7 432), detergents (3 78), and plastics (6 219).

ELECTRICITY and MAGNETISM

ELECTRICITY and magnetism are probably the two most important practical applications of the physical sciences, and they are of ever increasing importance in industrial, scientific, and domestic life. Both are exact sciences with laws that can be expressed as mathematical formulae, but there is no sharp line dividing them, and phenomena of one very often explain phenomena of the other. Because of the many principles involved, it is possible here to present only a brief survey of the primary points, practical aspects are covered in many of the articles referred to in this Study Outline.

I. NATURE OF ELECTRICITY.

An electric current is a flow of electrons (3 221) from a negatively charged source to a positive body. Owing to the use of the early convention of the "one-fluid" theory (3 211), practical electrical science is based on the rule that an electric current flows from positive to negative. This apparent contradiction is retained for reasons of practical convenience. Electricity is said therefore to flow from a point of high potential towards a point of low potential (3 212) that is, from positive to negative (+ to -).

II. PROPERTIES OF ELECTRIC CHARGES.

A. **Static Electricity, or Electricity at Rest.** An electric charge or current is the result of converting some other kind of energy (e.g. heat, chemical energy, energy of moving water) into electrical energy. "Static" charges can be produced by friction (e.g. by rubbing a stick of sealing wax with a piece of dry flannel); a negative charge then appears on the sealing wax (3-210) but, as a charge of one "sign" (+ or -) cannot be induced without also creating a charge of opposite sign, an equal positive charge appears on the flannel, though this is soon dissipated. Rubbing a glass rod with a piece of silk usually induces a positive

charge on the rod. Free electrons travel readily in certain classes of substances, particularly the metals; these substances are called **conductors**. It is difficult to create charge by rubbing two conductors together, because the charges immediately tend to leak away. Frictional charges are best created upon non-conducting substances, called **insulators**. These terms are relative; it is best to regard an insulator as a substance having very poor conducting powers.

B. **Attraction, Repulsion, and Polarity.** The mutual behaviour of electric charges is summed up in the simple rule, "like attracts unlike, and repels like" (3 214). The sign of a charge (+ or -) is its **polarity**.

C. **Induction across Space.** A charged body upsets the balance between positive and negative charges in neighbouring bodies. A positively charged body placed close to the end of an insulated rod will attract electrons to the nearer end of the rod, leaving a negative charge at the other end (3 214). When the positively charged body inducing the potential is removed, these effects disappear.

D. **Potential.** When a point is said to be at a certain potential it means there is a potential electrical difference between the point and

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earth. Potential is similar to pressure and is measured in volts. It causes a movement of electricity from a point where it is higher to a point where it is lower. Difference between the potential at two points produces electric current between them. The "pressure" or electromotive force (e.m.f.) inducing the charge is the potential difference (p.d.) between the areas. If the potentials are of opposite sign, the e.m.f. is the sum of the potentials. The strength of a static charge can be measured by an electro-scope (3-216).

E. Electrostatic Capacity. A considerable number of free electrons can be accommodated between the molecules of certain substances, without any great change in the potential of the substance. In other substances, the addition of a few electrons produces a marked difference of potential. This relation between the amount of charge—that is, the quantity of electrons absorbed—and the resulting change in potential is the capacitance or capacity of the substance (3-215).

F. Capacitors. If an insulated body, such as a metal plate, be charged and another plate which is connected to the earth be brought near it, the capacitance of the first plate for holding electricity is increased. Such a device, which can consist of many plates separated by insulators, is called a capacitor or condenser (3-215), and is used in many practical ways where it is desired to accumulate electric charges.

a. Effect of Intervening Insulator or Dielectric. Experiments show that the potential caused by the presence of the charges occurs on the surfaces of the intervening insulator or dielectric. When the strain becomes more than the dielectric can bear, a spark passes, and the charges unite. The capacitance of a capacitor, therefore, depends upon the dielectric's ability to withstand electric stress.

b. Leyden Jars. One of the earliest forms of capacitor is the Leyden jar (*f. i.*), used in the early days of radio transmission.

III. MOVING CHARGES—ELECTRIC CURRENTS.

A. Nature. An electric current is a flow of electrons along a conductor. Such a flow is set up by discharging a capacitor, but is over almost instantly. In order to have a steady current, there must be some means for creating a charge, or potential difference, as rapidly as the flowing electrons carry the charge away. Such a current can be produced by electro-chemical means; the dissolving of a metal electrode by an electrolyte in a cell (1-386); or by an electro-thermal process, in which heat energy is transformed (as in a thermocouple, when the junction of two dissimilar metals is heated); or by electro-magnetic induction, as in the dynamo and alternator (3-142). Dynamos and alternators can be driven by a prime mover such as a steam engine or an internal combustion engine; or even by a machine which is rotated by pedals operated as in some bicycle lighting sets. Water power can be used to drive water turbines (hydro-electric installations, 4-127), and so to rotate dynamos or alternators.

B. Creation of Currents by Chemical Means. The first and simplest means of creating a galvanic current is by the chemical energy of a so-called voltaic cell (1-386).

a. Voltaic Cells. A familiar example is the Leclanché cell (1-386). The electrodes here are a zinc rod or cylinder, and a carbon rod; the electrolyte is a solution of ammonium chloride. The Leclanché is the common "wet cell." In the common "dry cell" a moist packing is substituted for the watery solution. In other types of cell the electrodes may be two metal rods or plates (*e.g.* Daniell cell, zinc and copper), with sulphuric acid as the electrolyte.

b. Storage Batteries, or Accumulators (1-387). These depend upon the alteration in chemical composition of the metallic plates when the cell is slowly charged from a source of electric current; after charging, and upon connexion to an external circuit, the chemical process reverses, and chemical energy is then transformed into electric energy. In the lead-acid storage battery (1-387) the plates are grids of lead, filled with a paste of red lead (positive plate) and litharge (negative plate); the electrolyte is sulphuric acid diluted with water. In another type (nickel-iron cell), the active materials are nickel oxide and iron oxide, with potassium hydroxide as the electrolyte.

c. Polarisation. In the simple voltaic cell, the chemical action gradually accumulates hydrogen upon the carbon plate. When a certain amount has accumulated, it blocks further action, and current output ceases. This blocking is called polarisation, and is prevented by using chemicals, such as manganese dioxide, to remove the hydrogen (1-387).

C. Creation of Currents by Irradiation. The thermocouple (*see A, left*) can be heated by the radiation from a hot body, and the electric current so produced can be measured to determine the amount of radiation. Another method (6-163) of producing electricity is to allow light to fall upon a photo-sensitive substance (*e.g.* iron coated with a selenium compound, in contact with a thin film of silver). Only a tiny current is thus produced. The main types of photo electric cells are those in which the shining of a light upon the sensitive surface lessens electrical resistance (*e.g.* selenium), or acts as a "valve" in causing an electron flow from the sensitive surface in proportion to the amount of illumination (*e.g.* photocell sensitized with caesium and silver).

D. Creation of Currents by Mechanical Means. Usually when traced back these devices depend upon heat engines. But the hydro-electric generator and pedal-operated machines mentioned under A (*on left*) are purely mechanical devices.

E. Creation of Currents by Contraction and Expansion of Crystals. This phenomenon is called Piezo-electricity (6-196).

IV. LAWS OF DIRECT CURRENTS.

A. Direct and Alternating Currents (3-142). A current may flow steadily in one direction, as it

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does from a voltaic cell, as or it is delivered from the commutator of a dynamo (3-142). Or it may reverse direction periodically—many times per second, as does current delivered by an alternator; a given point will then be negative at one instant, and positive at another instant (3-143). The first type is a direct current (D.C.) and the second is an alternating current (A.C.). Alternating currents are created by electro-magnetic induction.

B. Attributes of a Direct Current. The characteristics of a direct current are determined by the following elements: the quantity of current (symbol I), measured in amperes; the pressure (symbol V), which drives the current, measured in volts; and the resistance which the current encounters (symbol R), measured in ohms. The pressure is the "potential difference" between the terminals of the generating unit supplying the current. It is usually called the electro-motive force (e.m.f.). The power of the current depends upon both the quantity of current and the pressure under which it flows, and the product of the voltage and the current. Power is measured in watts (3-210).

C. Ohm's Law. The relation between potential (pressure), current, and resistance is expressed by Ohm's Law (3-211): that the current in a circuit is equal to the voltage (V) divided by the resistance (R). Thus $I = \frac{V}{R}$.

D. Divided Currents. When a current passes through one element after another in a circuit—as when it passes through a number of lamps (3-212)—the elements are said to be connected in series. When branches divide the circuit and send a part of the current through each element, the elements are said to be connected in parallel (3-212).

E. Measurement of Current (3-216). Electric currents are measured by means of instruments of various kinds and types. Resistance (ohms) is measured by Ohmmeters. Those which measure amperes (current) are called Ammeters, and those which measure volts (pressure) are called Voltmeters.

V. MAGNETISM : NATURAL MAGNETS.

The accepted theory of magnetic domains explains the properties of magnets as being due to the symmetric arrangement of molecular magnets within the body.

A. Polarity. The north-and-south-pole phenomenon in magnets is explained in 5-82 and in the article on the Compass (2-474). The magnetised needle of a compass, placed at any point in the earth's magnetic field, aligns itself with that field to point towards the magnetic pole (5-83). The article on the Compass also explains what is meant by magnetic deviation, and by variation.

B. Magnetic Dip. A magnetic needle so mounted as to be able to move freely in all directions will be found, if observed anywhere but on the magnetic equator or "acclinic" line, to dip at one end. The angle thus made with the horizontal is called the inclination or magnetic dip.

C. Magnetic Substances and Magnetic Penetration. Substances which can be magnetised either temporarily or permanently are said to be magnetic. The important ones besides iron and steel are other ferrous metals, such as nickel and cobalt and certain alloys. Magnetic force acts freely through all non-magnetic substances (5-83), but is screened by sheets of magnetic substances. Substances only weakly magnetic are said to be para-magnetic (5-83); substances which are anti-magnetic and which cause the lines of force to diverge are said to be dia-magnetic (5-83).

D. Lines and Fields of Magnetic Force. Magnetic flux seems to act along lines called lines of force (5-84), flowing out from the north pole and into the south pole. Those lines can be demonstrated by placing a glass plate or a stiff paper over a magnet and dusting iron filings upon it (5-85). The filings arrange themselves along the lines. A magnetic field is the complete group or pattern of lines depicting magnetic conditions.

E. Natural and Artificial Magnets. Pieces of magnetic iron ore, or of natural magnetic iron, called lodestones (2-474), were known to the ancients as having the power of attracting iron. Later, lodestones were used as compasses (2-474). A piece of ferrous metal stroked with one pole of a bar magnet is magnetised in turn, and acquires N. and S. polarity. Industrial permanent magnets are made to day by placing a piece of suitable metal in the field of an electro-magnet (see following Section, VI).

VI. ELECTRO-MAGNETIC INDUCTION.

The fact that electricity and Magnetism are related phenomena was discovered when Oersted established that an electric current had magnetic effects (3-210; 5-84), and Faraday (3-340) found that a magnetic field generated electric currents (3-142).

A. Magnetic Field of a Current. When direct electric current passes through a wire, a magnetic field is created. In any plane cutting squarely across a straight wire, the lines of force are formed as concentric circles with the wire as a centre (5-85). If a wire carrying a current is bent into a loop, all the lines of force enter the loop at one face and come out at the other face. If several loops are put together, to form a coil, nearly all the lines of force will pass around the outside and through the centre of the coil, as if it were a single wire (5-85). If an iron core be placed within the loops of the coil, the power is greatly increased, and the device is called an electro-magnet (5-85). The strength of an electro-magnet depends upon the ampere-turns, i.e. the strength of the applied current and the number of loops or turns of wire which form the coil.

B. Induction of Current by a Magnetic Field. Faraday found that when lines of magnetic force move across a conductor, or when a conductor moves across lines of magnetic force, a current is set up or induced in the conductor. This discovery made it possible to turn mechanical

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energy into electrical energy by the dynamo and alternator (3-142).

- C. **Character of Induced Currents.** Current is induced as described above only when the conductor is moving in the magnetic field; and the strength of the induced e.m.f. varies directly as the speed of the moving conductor. If the magnetic field moves and the conductor remains stationary, the effect is the same. Any induced current has such a direction that the magnetic action it sets up after it starts tends to resist or oppose the motion that produces it.

D. **Currents Induced by Other Currents.** A change can be produced in the field of an electro-magnet by altering the intensity of the current which flows through it and produces the field. Thus, if the coil of the magnet be supplied with direct current rapidly interrupted, a flow of current occurs rapidly varying in intensity at each "make" and "break" of the circuit (4-259), though not reversing in direction. A current rapidly turned on and off in this manner will set up an induced current in any conductor that lies across the lines of force. It is upon this principle that the induction coil (4-258) operates.

GEOGRAPHY

IF you could make from memory an accurate map of every country in the world, placing every mountain, every river, every gulf, every island, every boundary, every city and town in its exact and proper place, you might still know very little about Geography. You must learn to see a map as you see the outline of a picture which your imagination fills with bold scenery, flowing rivers, cloud capped mountains, fertile plains, great green forests, wind-swept deserts, and, above all, people at work and play.

Geography, as treated in this Outline, is the study of the Earth *as the home of Man*. Thus, it deals with such things as the branches of mankind, their character, and their customs; the influence of climate upon crops and industries; the kinds of plants and animals that thrive in various regions; the ties of trade that bind nations and peoples together; the causes of wealth and poverty in different parts of the world—in fact, with the whole *present* structure of civilization. In so far as the past physical history of the world helps an understanding of the present, Geography encroaches on the special field of Geology. And in so far as the past customs of peoples have influenced their present manners, it encroaches on the field of History proper. A knowledge of Political Science, Economics, and every other branch of the "social sciences" is of prime importance to a complete understanding of Geography.

PHYSICAL GEOGRAPHY

The Earth as a Whole and Its Relation to the Sun

I. THE EARTH (3-149)

- A. **Its Form and Size.**
a. Gravitation (4-65).
b. Magnetism (5-81).
- B. **Motions of the Earth.**
a. Rotation on its axis (3-149).
b. Revolution round the Sun (1-278).
- C. **Results of Earth's Motions.**
a. Rotation on axis causes day and night (3-55).
b. Revolution round Sun, coupled with inclined axis, causes changing seasons (6-526).

amounts on the earth's surface to about 3,030 miles

b. **Boundary Lines.** The limit of the Tropics North of Equator is called the Tropic of Cancer; South of Equator the Tropic of Capricorn.

- B. **Frigid Zones:** regions of greatest cold—those portions of the earth surrounding the geographical Poles, where, *at least once* in every year, the sun does not rise above the horizon at noon, and where, *at least once* in every year, the sun does not sink below the horizon at midnight. At the Poles the sun remains continuously above the horizon for six months, and then remains below the horizon for six months.

II. ZONES OF THE EARTH.

- A. **The Tropical or Torrid Zone:** the region of greatest heat—that portion of the earth where, at some time during the year, the sun is *directly overhead at noon*, so that the rays strike down perpendicularly (4-209; 3-294).
- a. **Extent.** Since the earth's axis is $23\frac{1}{2}$ degrees from the perpendicular, the Tropical Zone occupies a belt of $23\frac{1}{2}$ degrees wide on each side of the Equator. This makes the whole tropical belt 47 degrees wide, which

a. **Extent.** $23\frac{1}{2}$ degrees on each side of the two Poles, or 47 degrees in all. Because the earth is slightly flattened at the Poles (that is, is an oblate spheroid), 47 degrees there amount to nearly 3,300 miles.

b. **Boundary Lines.** The North Frigid Zone is bounded by the Arctic Circle; the South Frigid Zone by the Antarctic Circle.

- C. **Temperate Zones:** regions of moderate heat and cold—those portions of the earth lying

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between the Tropical Zone and the Frigid Zones, where the sun is never directly overhead and yet where it never-fails to appear in the course of 24 hours.

Extent. Since there are 90 degrees between the Equator and each of the Poles, 23½ of

which are in the Tropical Zone and 23½ in the Frigid Zone, it follows that each of the two Temperate Zones is 43 degrees in width, or about 2,960 miles. They are called respectively North Temperate Zone and South Temperate Zone.

The Story of the Earth's Materials

III. GEOLOGY (3-515); PHYSIOGRAPHY (6-138).

Note : Geology deals with the history of the earth's crust and of the materials that compose it. Physiography deals with the characteristic relief features of the earth's surface and with the causes that produced them.

IV. ATMOSPHERE OR AIR.

A. Nature and Functions of the Atmosphere (5-180).

B. Atmosphere and Climate (4-209).

a. **Temperature :** the earth gets heat from the sun (4-146); temperature and weather maps—the meaning and usefulness of “isotherms” (2-410).

b. **Moisture in the atmosphere :** How moisture is measured with the hygrometer (4-225); How moisture gets into the atmosphere by evaporation (3-319); How the atmosphere releases moisture by condensation and precipitation: clouds (2-421); fog (3 405); dew (3 82); rainfall (6-360); snow (7-77); frost (3-477); How rainfall is measured (6-361).

c. **Pressure of the Atmosphere :** Variation in air pressure (1-80); How air pressure is measured with the barometer (1-370).

d. **Movements of the Atmosphere—wind** (7-457).

e. **Storms** (7-169).

f. **The British Meteorological Office and its work** (7-433).

V. HYDROSPHERE OR WATER.

A. Nature and Functions of the Waters of the Earth (7-424).

B. Water Formations :

a. **Ocean** (5-494).

b. **Lakes** (4-438).

c. **Rivers** (3-515).

d. **Springs** (7-138).

C. Oceans.

a. **The Ocean Beds** (5-498); size of oceans (5-494); ocean depths (5-495).

b. **Movements of Ocean Waters :** nature of waves (7-432); ocean currents (5 498); tides (7-274).

c. **Life in the Oceans** (5 127); corals and their work (2-504); phosphorescence (6-161).

VI. LITHOSPHERE OR ROCK AND SOIL.

A. Rock Formations of the Earth (3-515).

a. **Igneous or Unstratified Rock**—comprising all the rocks that have solidified from an intensely heated molten state: lava (4-456); granite (4-60); basalt—Fingal's Cave (7 140); Giant's Causeway (4 87; 2 88); quartz (6 320); feldspar (3 345); obsidian (4 456); porphyry (4-456); pumice (6-305).

b. **Sedimentary or Stratified Rock** comprising those rocks produced by deposits of disintegrated matter from the older rock forms, by deposits of animal or plant remains, or by chemical precipitates.

1. **Rock Sediments :** sandstone (6 320); clay (2 406); mudstone; shale (*f.i.*).

2. **Animal and Plant Sediments :** limestone (4 509); dolomite (4 510); chalk (2 299); coal (2 426); peat (6 103); asphalt (1 274).

3. **Chemical Sediments :** gypsum (4 112); salt (6 490).

c. **Metamorphic Rock** comprising ancient sedimentary forms that have undergone profound chemical and structural changes: marble (5-120); flint (3 388); slate (7 65); mica (5 189).

B. The Formation of Soil (7 83).

a. **Residual Soils**—formed by the breaking down of the underlying rocks: sand (6 495); clay soils from shale (7-83); limestone soils.

b. **Transported Soils**—consisting chiefly of “alluvial” soils transported and deposited by rivers, “aeolian” soils transported by the wind, “drift” soils transported by glaciers, and “ash” soils composed of ashes from volcanoes: loam (7-83); loess (*f.i.*); drift (4 228).

Erosion by water (7-427); by wind.

Chief Features of the Earth's Surface and Their Origin

VII. PHYSIOGRAPHY OF THE EARTH (6-186).

A. Continents (6-186).

B. Mountains (6-187).

a. **Origin of Mountains ;** “old” and “young” mountains.

b. **Effect of Mountains on Climate** (2-409); effect upon rainfall (6-360).

c. **Effect of Mountains on Human Life** (6-187).

d. **Mountains the Chief Sources of Minerals.**

C. Rivers.

a. **Origin of Rivers** (3-515); springs (7-138).

b. **The Work of Rivers :** cutting valleys and transporting soil; forming alluvial plains and deltas.

c. **Effect of Rivers on Human Life :** valuable for transport; irrigation; water power.

D. Valleys (7-375; 6-187 188).

a. **Origin of valleys.**

b. “Old” and “young” valleys.

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E. Lakes.

- a. Origin of Lakes (4-438).
- b. Influence on Human Life. Ancient lake-dwellers (4-489); lake transport (Great Lakes, 4 68).
- c. Salt Lakes (Dead Sea, 3-55; Great Salt Lake, Utah, U.S.A., 7-371).

F. Plains and Plateaux.

- a. Origin of Plains and Plateaux (6-187).
- b. Influence on Human Life; concentration of population on plains.
- c. Various Kinds of Plains: tundras (1 264); steppes (1-266); savannas (6 187); pampas (1-223); prairies.

G. Deserts (3 78).

- a. The Sahara as an example of the origin of deserts (6-484).

- b. Other deserts: in Asia (1 266); in Australia; in South Africa (1 49), etc.

H. Islands.

- Origin of some Islands: volcanic action; the activity of the coral polyp (atolls) (6-28).

I. Other Features of the Earth's Surface.

- a. Volcanoes- their origin and behaviour (7 404).
- b. Earthquakes (3 152).
- c. Geyzers (4-15).
- d. Caves (2 276).

VIII. MEASURING AND MAPPING THE EARTH.

A. The Points of the Compass (2 474).

B. Latitude and Longitude (4 452).

C. Maps and Map-making (5-118).

DIVISIONS OF MANKIND

FOR the student of geography it is not so important to know the relationships and origins of peoples as it is to have a convenient method for grouping them according to their present-day customs, their degree of civilization, and their geographical distribution. The grouping followed in this Outline brings out some of the more generally accepted blood affinities, but in the main its purpose is to emphasise the geographical and cultural side of this great and important subject.

I. MAN'S PLACE IN NATURE (1-154; 3-323).

II. DIVISIONS OF MANKIND.

A. The Many Methods of Classification (6 333).

- a. Differences in hair.
- b. Differences in language.
- c. Geographical distribution.

B. Divisions Based on Colour and Geographical Distribution.

- a. The Caucasian, European, or white.
- b. The Ethiopian, African, or black.
- c. The Mongolian, Asiatic, or yellow.
- d. The Amerind, American, or red.
- e. The Malay and Polynesian, or brown.

III. WHITE.

Note: Certain peoples, once important in history but now no longer existing as separate group have been included in this list; their names are printed in italic type.

A. South Mediterranean.

- a. Hamitic Types found chiefly in North Africa: Berbers (1-50); *Ancient Aegeans* (1-22); *Etruscans* or *Tyrrhenians* (3-305); Tuaregs; Copts; Kabyles, Masai, Gallas, Somalis.

Note: The people to-day called "Moors" are chiefly of Berber origin, but Arab and Negro blood is distinctly traceable among them. Historically

the term Moor is often applied to the Mahomedan invaders of Spain.

- b. Semitic—Types found chiefly in the Arabian Peninsula, Asia Minor, and North Africa: Arabs (1-190); Armenians; *Assyrians* (1-337); *Carthaginians* (2-255); *Hittites* (3-200), Israelites (Jews) (4-373); Syrians; *Philistines* (6-157); *Phoenicians* (6-160); *Canaanites* (4-374; 6-161).

B. North Mediterranean.

Note: The Europeans of to-day are the chief representatives of this great division, and therefore it is called the "North Mediterranean" branch of the white group. It includes, however, several Asiatic groups. The term "Aryan" (1-261), often used to describe those members of the white group who are believed to have originated in western Asia, is synonymous with "Indo-European" and can properly be used of living peoples only when they are being classified according to language.

- a. Primitive European Types: Basques (7-103); Iberians (Spain); Ligurians (Genoa) (*f.i.*).
- b. Celts (2-288); Bretons (2-90); *Britons* (2-73); *Gauls* (6-430); Irish; *Picts* and *Scots* (2-75); Welsh.
- c. Latin Type: French; Italians; Portuguese; Rumanians (Rumfans or Vlachs); *Sabines* (6-420); Spanish.
- d. Illyric Peoples: Albanians; *Illyrians*.
- e. Hellenic Peoples: Greeks; *Macedonians* (5-62).
- f. Lettic Peoples: Letts (4-453); Lithuanians.

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- g. Teutons; **EAST TEUTONS**—Danes (1-103; 3-276); *Goths* (4-48); *Northmen* or *Normans* (7-400; 3-314); Scandinavians; *Vandals* (7-379); Burgundians; **WEST TEUTONS**—*Angles* (2-75; 3-276; 5-199); Dutch; English; *Franks* (5-199, 202; 3-313, 449); Germans; *Saxons* (6-502; 5-199; 3-276); *Alemanni* (5-204); *Lombards* or *Lombardi* (5-19).
 h. Slavs (7-66; 3-313; 5-204). Bulgarians (1-350); Croats (7-66); Czechs or Bohemians (7-66); Montenegrins (5-250); Poles; Russians; Serbs; Ruthenians or Ukrainians; Dalmatians, Moravians, Slovaks; Wends, etc.
 i. Indo- Iranians: Armenians (1-242); Baluchis (1-358); Kurds (*f.i.*); *Medes* (5-159); Persians; Hindus; Ceylones or Sinhalese.
 j. **Caucasic Types**: Circassians, Georgians.

IV. BLACK

A. Negrito Type.

- a. Equatorial Pygmies (6-312; 5-396).
 b. South African Branches: Bushmen (6-312); Hottentots (1-50).
 c. East Indian Groups: Negritos of Philippines (6-156); Andaman Islanders (4-241); Semangs (5-94); Sakais (6-312).
 d. Australian Groups. Blackfellows (1-314, 317 illus.); *Tasmanians*.

Note: The list of peoples named above presents unusual difficulties to the ethnologists. The student is specially cautioned against regarding this arrangement as an implication of true blood affinity. They are grouped together because of their general resemblance to the Negro type, and because they present on the whole the lowest forms of civilization found in the world to-day.

B. True Negro Type:

- a. Sudanese Negroes.
 b. Guinea Coast Negroes: Ashantis.

C. Negroid or Bantu Type (4-400; 1-51).

Basutos (natives of Basutoland); Bechuanas (natives of Bechuanaland); Kaffirs (1-51, 7-90); Swahilis (*f.i.*); Zulus (7-527).

V. YELLOW.

A. Eastern Mongolian Type.

- a. Southern Chinese.
 b. Indo-Chinese (4-256; 6-158): Annamese, Burmese; Siamese, Tonkinese; Shans, Chins, Kachins.
 c. Tibetan: Bhutanese; Nepalese; Tibetans.

B. Western Mongolian Type. This type is sometimes called "Ural Altaic."

- a. Manchu Group.
 b. Mongol-Tartar Group: Kalmuks (5-239), Cossacks (2-514); Tartars (7-228); Huns (4-208); Kirghiz (*f.i.*); Turkmen; Turks.
 c. Finnish Group: Estonians or Ests; Finns; Lapps (4-446; 7-201); Magyars (5-86).
 d. Japanese-Korean Group.

VI. BROWN.

A. Dravidian Group (4-241): Gonds, Bhils, Tamils (4-241); Veddahs (2-297).

B. Malayan Type.

- a. East-Indian Group: Dyaks (2-18); Javanese (4-355); Malays (5-93); Sumatres; Igorots and Moros (6-156).
 b. Madagascar Group: Hovas and other Malagasies (5-66).

C. Oceanic Type.

- a. Papuan or Melanesian Group: New Guineans; New Hebrideans, New Caledonians, Solomon Islanders; Fijians (in part).
 b. Micronesian Group: Inhabitants of the Mariana, Pelew, Caroline, Marshall, and Gilbert Islands.
 c. Polynesian Group: Hawaiians (4-139); Maoris (5-425); Samoans; Fijians (in part), Tahitians, Tongans, Marquesans (6-28), and other inhabitants of the more easterly Pacific islands.

Note: Some ethnologists believe the Polynesians to be descendants of an ancient Aryan or white stock that came eastward across south-eastern Asia and the waters of the Pacific centuries ago, settling in one after the other of the islands they now inhabit; others believe the Polynesians to be of Amer-Indian origin, descended from migrants crossing the Pacific westward from America.

VII. RED.

A. Arctic Type: Eskimos (3-296) and Aleutian Islanders or Aleuts (1-90).

B. North American Types (Alaska, Canada, and United States): Athabascan, Algonquian, Iroquoian, Muskogean, Siouan, Shoshonean, and other groups (6-371).

Note: The so-called "Pueblo" Indians did not belong to any single tribe or group, but consisted of several independent stocks in various parts of the south-west who were distinguished by their settled and semi-civilized life in tribal villages.

C. Mexican and Central American Types.

- a. Nahuatl Group: Aztecs (1-331).
 b. Mayan Group: Mayas, in northern regions of Central America.

D. South American Types. The chief groups are:

Chibchan (Colombia); Quechuan (Peru; *Incas*, 4-237); Aymaran (southern Peru, Bolivia, and northern Chile); Calchaquian (northern Argentina); Araucanian (Chile and western Argentina, 2-359; 7-98); Cariban (Venezuela, Guiana, and Amazon delta); Tupi-Guarani (Brazil); Arawakan (formerly inhabiting Haiti, Puerto Rico, Cuba, the Bahamas, etc., as well as their present home in the Amazon Valley); Patagonian (southern Argentina, 6-96); Fuegian (Tierra del Fuego, and extending a short distance north of the Strait of Magellan).

GEOGRAPHY EUROPE

JUDGED by its size alone, Europe (3-308; map, 3-f.p. 308) is a minor division of the Earth's surface. Indeed, it is little more than a broken and irregular peninsula projecting westward from the vast land mass of Asia, and it is treated as a separate continent only because of its human and historical individuality. Yet, in the history of modern civilization and in the broadest geographical sense, Europe has played by far the most important part of all the continents. It has given its "point of view" to the world.

Why has Europe prevailed over so much of the world? An adequate answer to that question would involve consideration of countless subtle forces and influences that it is perhaps impossible to analyse fully, but it is certain that Geography would play an important part in the answer to the problem.

1. POSITION AND AREA.

- A.** The situation of Europe in the centre of the land masses of the globe gives it an enormous commercial and political advantage. This advantage of position will be made apparent by a glance at a map of the world.
- B.** The area of Europe (about 4,000,000 square miles) is about one-fourteenth of the land area of the Earth. Its population of over 500,000,000 is approximately one-eighth of that of the Earth. The overcrowding of Europe forced its people to seek food supplies in other lands, and an outlet for its surplus population.

II. PHYSIOGRAPHY

A. Geological Influences :

a. The Glaciers of the Ice Age (4 25 ; 1-125, 4-228).

b. The Sinking of the Land. To this is due the exceedingly irregular outline of Europe, with its countless peninsulas and bays, its land-locked seas, and its numerous islands.

- B.** Mountains and Highlands. The mountains of Europe are, as a whole, comparatively low and scattered, and nowhere do they cut off large interior areas from the moist sea winds.

a. Central and Southern Mountain Groups : Alps (1-120); Apennines (1-180); Dinaric Alps (3-300); Transylvanian Alps (6-469); Carpathian Mountains (2-245); Balkan Mountains (1-349).

b. Central Highlands : Central massif of France (3-434); Jura Mountains (4-386); Vosges Mountains (7-406); Black Forest (1-478); Bavarian Highlands; Thuringian Hills and Harz Mountains (4-135); Bohemian Forest.

c. South-Western Mountains and Highlands : Pyrenees (6-313); Sierra Nevada (*f.i.*) and other ranges and plateaux forming part of the Iberian Peninsula.

d. North-West Highlands : Brittany highlands; highlands of England and Wales, Scotland, Ireland; Kjolen Mountains of Scandinavia (5-462); mountains of Finland.

e. Mountains of the extreme East and South-East : Ural Mts. (7-369); Caucasus Mts.

C. Lowlands.

a. Great Central Lowland : English plain; Paris Basin; Lowlands of Belgium and the Netherlands; North German Plain; plains of Denmark and S. Sweden; Great Plains of Russia.

b. Smaller European Lowlands : Hungarian Plain; Lombardy Plain; Garonne Basin.

D. Seas and Chief Rivers flowing into them :

a. Mediterranean (5-166). Chief divisions : Adriatic Sea (1-20); Aegean Sea : Tyrrhenian Sea. Rivers Rhône (6-395) and Po (6-231).

b. Atlantic Ocean (1-292); Rivers of the Iberian Peninsula : Guadalquivir (7-6), Guadiana (6-297), Tagus (6-257), Douro. French rivers : Garonne (6-314), Loire (5-18).

c. North Sea (5-460) and English Channel : Seine (6-530); Thames (7-261); Meuse (Maas) (5-185); Rhine (6-390); Elbe (3-207).

d. Baltic Sea (1-357) Oder (*f.i.*); Vistula (7-403).

e. White Sea (*f.i.*), with the Northern Dvina (3-308); and Arctic Ocean, with the Pechora river.

f. Black Sea (1-480) : Danube (3-47), Dnieper, Don, Dniester (6-472).

g. Caspian Sea (2-256) : Volga (7-405).

- E.** Chief Islands forming part of Europe : Iceland (4-233); British Isles (2-35); Danish islands (3-72); Balearic Isles (1-349); Corsica (2-512). Sardinia (4-316; 3-314); Sicily (7-49); Crete (2-527); Malta (5-98); Aegean Is.

III. CLIMATE (3-308).

A. Climate of Europe is chiefly oceanic.

a. Russia has continental climate.

b. Gulf Stream (4-105) warms Western Europe, as do also warm, rain-bringing west winds.

B. Rainfall (6-360).

The British Isles

CUT off from the rest of Europe by the English Channel and the North Sea, the British Isles (2 85) have suffered no actual invasion from the Continent since the Norman Conquest in 1066. No part of these islands is far from the sea, on which their inhabitants have always been at home. Until, thanks to internal quiet, natural mineral resources, and the native inventiveness of the people, the "industrial revolution" began in Britain in the late 18th century, long before it started elsewhere, the population was small, and the islands produced all necessities for their inhabitants. With industrial development, the population increased; there was no longer enough home-grown food for all. British traders and sailors carried British manufactures to every corner of the globe, bringing back with them food, and raw materials for more manufactures, from distant lands still dependent on agriculture. The British Isles became the most prosperous of all countries. Two world wars and world-wide development of industry greatly reduced Britain's relative prosperity; but many advantages of the islands' geographical position remained. For *maps*, see 3-f.p. 248 (England), 4 282 (Ireland), 6 511 (Scotland), and 7 412 (Wales).

I. PHYSIOGRAPHY.

- A. Irregular Coastline produced by the rising and sinking of land.
- B. General characteristics.
 - a. Description of English country (3-247).
 - b. Wales, a country of hills and low mountains (7-410).
 - c. Scotland (6 510) and its highlands.
 - d. Ireland, an inland plain surrounded by low mountains (4-281).
- C. Soil. Fertile in England; good in Scottish lowlands, poor in highlands; thin in Ireland.
- D. Lesser Islands: Hebrides (4-152); Shetland Islands (7 27); Isle of Man (5-110); Isle of Wight (7-449); Orkney Islands (6-4); Channel Islands (2-302); Scilly Isles (6-509).

II. CLIMATE AND NATURAL RESOURCES.

- A. Climate tempered by Westerlies and Gulf Stream drift.
- B. Fairly heavy rainfall.
- C. Natural Resources.
 - a. Many good harbours.
 - b. Coal, iron, tin, copper, zinc, and lead.
 - c. Fishing ground in the North Sea.

III. CHIEF INDUSTRIES.

- A. Manufacturing: Textiles—cotton; woollen, linen; silk; rayon; nylon. Porcelain and pottery; iron and steel products; shipbuilding; motor vehicles; aircraft; electrical equipment.

- B. Engineering in all its branches.
- C. Mining.
- D. Fishing.
- E. Agriculture, including stock raising and dairying.

IV. COMMERCE AND TRANSPORT.

- A. International, Commonwealth, and Colonial Trade.
- B. Transport
 - a. Shipping.
 - b. Rivers and Canals.
 - c. Roads.
 - d. Railways.
 - e. Aviation.

V. IMPORTANT CITIES

- A. In England: London (5 19); Birmingham (1 473); Liverpool (4 524); Manchester (5 111); Sheffield (7 23); Leeds (4 475); Bristol (2 71); Newcastle-upon-Tyne (5 394); Plymouth (6 229); Southampton (7 101); Dover (3-109), etc.
- B. In Scotland: Glasgow (4-28); Edinburgh (3 162); Aberdeen (1 4); Stirling (7-158); Lanark (4 444); etc.
- C. In Ireland: Dublin (3 129); Belfast (1 416); Cork (2 505); etc.
- D. In Wales: Cardiff (2 220); Swansea (7 200); Aberystwyth (2 220); etc.

The British Commonwealth of Nations

(Flags: see col. plates 3-384, 345. For *map*, see 2 83)

1. SELF-GOVERNING MEMBERS.

Australia (1 312); Canada (2-195); Ceylon (2 297); New Zealand (5-422); Pakistan (6 39); Union of South Africa (7-88).

II. ASSOCIATED INDEPENDENT STATES.

- A. Republic of India (4 239): an independent republic within the Commonwealth, recognizing the British Sovereign as its First Citizen.
- B. Republic of Ireland (4-284): an independent republic outside the Commonwealth, but not recognized as a foreign country.

III. COLONIES, PROTECTORATES, AND DEPENDENCIES.

- A. In Europe: Gibraltar (4 20); Malta (5 98).
- B. In Africa:
 - a. British Somaliland (7 84).
 - b. British East Africa (2 84): this includes Kenya Colony and Protectorate, Uganda Protectorate, Tanganyika Territory, Zanzibar Protectorate and Pemba.
 - c. Central Africa. Federation of Rhodesia (6-394) and Nyasaland (6-395).

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d. South Africa. South-west Africa (Protectorate of the Union of South Africa) (7 89); Bechuanaland; Swaziland, Basutoland (7 88, 89).

e. West Africa (7 440): Nigeria, Gold Coast, Sierra Leone, Gambia, Cameroons, Togoland.

f. Islands. Mauritius (5 149); St. Helena and Ascension Island; Tristan da Cunha (*f.i.*).

Note: The Anglo Egyptian Sudan became the Republic of the Sudan in 1956 (7 179).

C. In Asia: Cyprus (3 20); Aden (1 18); Bahrain Islands (1 191); Seychelles Islands (*f.i.*); Singapore Colony (7 57; 5 94); Federation of Malaya (5 93); Hong Kong (4 191).

D. In North and South America: Bermudas (1 434); Bahamas (1 347); Barbados (1 366); British Honduras (2 292); Jamaica (4 337);

other West Indian Islands (7 442); Trinidad (7 317) and Tobago (*f.i.*); British Guiana (4 102); Falkland Islands (3 339).

E. Islands of the Pacific: British North Borneo (including Brunei and Sarawak) (2 18); Australian New Guinea (Papua and N.E. New Guinea) (5 395); Fiji Islands (3 351); New Hebrides (ruled jointly with France); New Britain and New Ireland; British Samoa; British Solomon Islands; Gilbert and Ellice Islands; Tokelau Islands; Tonga (or Friendly) Islands; Pitcairn Island; Cook Islands (6 26-32).

Note: After the First World War former German territories in New Guinea, New Britain, and the Solomons were mandated to Australia, German Samoa to New Zealand. These territories and former German colonies in Africa, mandated to the U.K., were placed under U.N. trusteeship in 1946.

France

STRETCHING from the North Sea to the Mediterranean, and bordered by the Atlantic Ocean on the west, France (3 431, *map*, 3 432) has broad open gateways to all avenues of world commerce. Its position gives it a variety of climate, ranging from warm to temperate, so that the soil produces, with the aid of the abundant rains, a wide range of crops. Able to satisfy with home products virtually all their frugal requirements, the French have had in the past little incentive to strive for foreign commerce, and small liking for colonisation. Their martial qualities, however, made France a world power, still of great standing despite loss of strength in the two World Wars.

I. PHYSIOGRAPHY (3 432).

A. Mountains and Highlands:

a. Chief Ranges: Alps (1 120); Pyrenees (6 313); Jura Mts. (4 386); Vosges Mts. (7 406).

b. Lesser Ranges and Highlands: Ardennes Hills (1 222); Auvergne Mts.; Cevennes chain; highlands of Brittany and Normandy.

B. Plains, including Paris Basin (3 433).

C. Chief Rivers: Seine (6 530); Loire (5 18); Garonne (6 314); Rhone (6 395).

D. Island of Corsica (2 512).

II. CLIMATE.

The winds from the Atlantic bring abundant moisture, keep the temperature mild.

III. NATURAL RESOURCES.

A. Fertile soil.

B. Minerals: coal, iron, and building stone.

C. Forest lands.

D. Rivers form valuable links.

IV. CHIEF INDUSTRIES AND PRODUCTS.

A. Agriculture is the most important industry.

a. Principal crops: Wheat, oats, rye, barley, potatoes, sugar-beet.

b. France leads in grape growing.

c. Livestock: cattle, horses, sheep, goats, pigs, poultry.

B. Fisheries: cod, oysters, sardines.

C. Mining and Quarrying.

D. Manufacturing: textiles and leather, wine, gloves, perfumes, soap, porcelain, iron and steel products, sugar.

E. Transport:

a. Rivers and Canals.

b. Roads.

c. Railways.

d. Airways.

V. CHIEF CITIES.

Paris (capital) (6 79); Marseilles (5 136); Lyons (5 55); Bordeaux (2 16); Lille (4 506); Nantes (5 316); Toulouse (*f.i.*); St. Etienne (3 434); Nice (5 430); Havre (4 138); Cherbourg (3 438); Rouen (6 456); Rheims (6 379); Amiens (1 139); Brest (2 55); Calais (2 166); Orleans (6 5); Metz (5 185); Versailles (7 394); Dunkirk (3 136).

VI. OVERSEAS COUNTRIES OF THE FRENCH UNION.

A. Algeria (1 108). This country of North Africa forms part of metropolitan France, and is represented in the National Assembly and the Council of the Republic in Paris.

B. Overseas Departments. Martinique (5 138); Guadeloupe (4 100); Reunion Island; French Guiana (4 102).

C. Overseas Territories.

a. French West Africa (6 485): Senegal, French Guinea, Ivory Coast, Dahomey, French Sudan, the Niger, Mauritania.

b. French Equatorial Africa (2 482): Gabon, Middle Congo, Ubangi Chari, Chad.

c. Madagascar and its dependencies (5 64).

d. French Somaliland (7 84).

e. New Caledonia and its dependencies.

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- f. French Oceania.
- g. Saint-Pierre and Miquelon, N. America.
- D. Trusteeship Territories.
Part of Togoland and the Cameroons.
- E. Anglo-French Condominium.
The New Hebrides, Pacific Ocean.

Note : Certain territories within the French Union until the mid-1950s have since achieved full independence. These are the former protectorates of Morocco (5-284) and Tunisia (7-324), in North Africa; and the states of Vietnam (7-399), Cambodia (2-179), and Laos (4-445), in Indo-China (4-256).

Belgium

BELGIUM (1-417; *map*, 1-418) is primarily a manufacturing country, most of the population being crowded into industrial centres. But the countryside is covered with small farms that are made to yield large crops by intensive and careful cultivation.

I. PHYSIOGRAPHY.

- A. General character of the country : sand-dunes along the sea, hills (Ardennes) in the south-east, fertile plains in between.
- B. Chief Rivers : Scheldt (*f.-i.*) or Escaut ; Meuse (5-185).

II. CLIMATE.

Like that of northern France and southern England, with mild winters, cool summers, and an abundance of rain.

III. NATURAL RESOURCES.

- A. Chief minerals : coal, iron, sand for making glass.
- B. Good farm land.

IV. CHIEF INDUSTRIES.

- A. Agriculture : principal crops are wheat, rye, flax, sugar-beet.
- B. Mining.
- C. Manufacturing : chief products are iron and steel, artificial silk, motor-cars, glass, lace, linen, wool, gloves, sugar.
- D. River and canal navigation.
- E. Fisheries.

V. CHIEF CITIES.

Brussels (capital) (2-99); Antwerp (1-178). Liège (4-493); Ghent (4 16); Bruges (2-97); Ostend (1-417); Louvain (5 45).

VI. BELGIAN COLONIAL TERRITORY.

Belgian Congo (2-481).

Grand Duchy of Luxemburg

THIS small, independent, mountainous territory (5-54), of about 1,000 square miles, lies between France, Belgium, and Germany. It is highly cultivated and has important iron deposits; it makes pig iron and steel.

Switzerland

SWITZERLAND (7-211; *map*, 7-214) is a land of high mountains and deep valleys. The mountains attract many visitors in winter and in summer; the valleys are carefully cultivated. Switzerland is also famous for its watches and clocks.

I. PHYSIOGRAPHY.

- A. Mountains : Alps (1-120); Jura Mts. (4 386).
- B. Narrow Plateau between the two ranges.
- C. Rivers rising in Switzerland : Rhine, Rhône, Aar, Ticino, Inn.
- D. Other Physical Features : Many lakes; majestic glaciers.

II. CLIMATE.

Much cooler than that of the surrounding lowlands. There are heavy rains in summer and great snow-falls in winter.

II. NATURAL RESOURCES.

The chief resources are the scenery, the pasture land, and the plentiful supply of water-power.

IV. CHIEF INDUSTRIES.

- A. Catering for Tourists.
- B. Dairying and agriculture : goats and cattle supply the very important dairying industry; crops are wheat, rye, oats, potatoes.
- C. Manufacturing : chief products are watches and clocks, precision instruments, cheese and condensed milk, chocolate, salt.

V. CHIEF CITIES.

Berne (capital) (1-435); Zürich (7-523); Geneva (3-511); Basle (1-380).

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The Netherlands

THE NETHERLANDS (5-370) is primarily a commercial country, whose prosperity rests upon thrift, bold seamanship, and the Dutch merchant's world-wide reputation for rigid honesty. Dutch navigators of the 15th and 16th centuries were among the most adventurous in the world, sailing East and West in search of new lands and markets, and founding colonies, part of which in the East developed into the republic of Indonesia.

I. PHYSIOGRAPHY.

- A. Alluvial soil brought by three rivers.
- B. Nearly half the land is below sea level. How the sea is kept out (5-372) and land reclaimed (5-377).
- C. Land is not naturally fertile.
- D. Rivers : Rhine (6-390) ; Maas (or Meuse) (5-185) ; Scheldt (*f.-i.*).

II. CLIMATE.

Damp and cool : severe cold in winter.

III. NATURAL RESOURCES.

A favourable situation for ocean commerce, a considerable area of pasture land, some coal and deposits of pottery clay.

IV. CHIEF INDUSTRIES.

- A. Dairying and dairy products.
- B. Agriculture : chief crops are rye, oats, potatoes, sugar-beet, wheat, flax, tulip-raising.

C. Manufacturing : textiles, ropes, dyes, chemicals, sugar refineries, aircraft factories, etc. ; diamond-cutting ; pottery making.

D. Shipbuilding.

V. COMMERCE AND TRANSPORT.

- A. Large amount of shipping.
- B. Canals, rivers, railways.

VI. CHIEF CITIES.

Amsterdam (1 141) ; Rotterdam (6-455) ; The Hague (seat of government) (4-116) ; Utrecht (7 372) ; Groningen (5-370).

NETHERLANDS WEST INDIES.

Surinam (Dutch Guiana) (4-101) ; Netherlands Antilles (Curaçao, etc.) (5-370).

NETHERLANDS NEW GUINEA.

Germany

NEITHER soil nor climate, nor the temper of its people, has inclined Germany (4-1 ; *maps*, 4-2, 6) to remain an agricultural nation. After the unification of the German states in 1871, Germany rapidly developed into a powerful manufacturing and commercial country, and because its workers were content with a lower standard of living than those of Britain, it became a serious trade rival of Britain in all the markets of the world. Defeat in two World Wars left Germany with little immediate outlet for a population heavy in proportion to its resources.

I. PHYSIOGRAPHY.

- A. Highlands in the South :
 - a. Bavarian highlands ; Black Forest (1-478).
 - b. Thuringian Hills and Harz Mountains (4-135).
 - c. Erzgebirge or " ore mountains " of Saxony (6-503).
- B. Northern Germany is part of great European plain.
- C. Chief Rivers : Rhine (6 390) . Ems (*f.-i.*) ; Weser (4-1) ; Elbe (3-207) ; Oder (*f.-i.*) ; Danube (3-47).

II. CLIMATE.

Drier and marked by greater extremes of temperature than the lands to the west. The winds from the Atlantic have lost much of their moisture by the time they reach central Germany.

III. NATURAL RESOURCES.

- A. Minerals : coal, iron, potash, building stone, petroleum.

B. Forests.

C. Water-power, from the many rivers of the mountains.

IV. INDUSTRIES.

- A. Manufacturing : iron and steel products, motor-cars, textiles, chemicals and dyes, pottery and porcelain ; beer, wine, jewelry, toys ; wood products.
- B. Agriculture : principal crops are wheat, rye, barley, oats, sugar-beet, hops, potatoes, flax, tobacco, grapes.
- C. Livestock.
- D. Shipbuilding and fisheries.

V. TRANSPORT.

- A. Railways, rivers, and canals.
- B. Roads.

VI. HISTORIC DIVISIONS OF GERMANY.

Prussia ; Bavaria ; Württemberg ; Baden ; Saxony ; Thuringia ; Hesse ; Hamburg ; Lübeck ; Bremen.

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VII. DIVISIONS AFTER THE SECOND WORLD WAR.

In 1945 the northern half of E. Prussia was incorporated in Russia (R.S.F.S.R.); rest of Germany east of the Oder was placed under the administration of Poland. The remainder of Germany was divided into the following zones of occupation :

- a. British (N.W.): Schleswig-Holstein, N. Rhine Westphalia, Hamburg, Lower Saxony.
- b. French (W.): Rhineland - Palatinate, Baden, Wurttemberg-Hohenzollern, Saar.
- c. U.S. (S.W.): Bavaria, Wurttemberg-Baden, Bremen, Hesse.

d. Russian (E.): Brandenburg, Saxony, Saxony-Anhalt, Mecklenburg.

In May 1949 the British, U.S., and French zones (except the Saar area, which in 1948 had been made an autonomous state) were formed into the (W.) German Federal Republic with Bonn as capital. In October 1949 the Russian zone was proclaimed the (E.) German Republic, capital (E.) Berlin.

VIII. CHIEF CITIES.

Berlin (1 432); Bonn (1 520); Hamburg (4 121); Munich (5 295); Leipzig (4 476); Dresden (3 126); Cologne (2 456); Frankfurt-on-Main (3 459); Hanover (4 128).

Austria

PART of the Dual Monarchy of Austria-Hungary before the First World War, Austria (1 822) was, after its defeat, reduced to a small republic in which more than one-fifth of the population lived in the capital, Vienna. Annexed by Germany in 1938, Austria became a separate country 1945, Allied-occupied until the peace treaty in 1955.

I. PHYSIOGRAPHY.

- A. **Mountains** : Alps in the western, central, and southern regions.
- B. **Lowlands** : the valley of the Danube lies between the highlands; and there is a small strip of the Hungarian plain in the east.
- C. **Rivers, etc.** : the Inn (4 263) is the most important tributary of Austria's chief river, the Danube (3 47); there are many fine lakes.

II. CLIMATE.

Austria has a varied inland continental climate, with heavy rainfall and snows in the mountains.

III. NATURAL RESOURCES.

In the lowlands and foothills, farmland and pasture; timber in the highlands (35 per cent. of total area is forested); deposits of iron, copper, zinc, lead, coal and lignite, magnesite, graphite, petroleum; hydro-electric power.

IV. INDUSTRIES.

- A. **Agriculture** : principal crops are wheat, rye, barley, oats, potatoes, and turnips. Grapes for wine. Horses, cattle, and sheep.
- B. **Manufactures** : textiles, pianos, iron and steel goods, perfumes and fashion goods.

V. CHIEF CITIES.

Vienna (capital) (7 397); Graz (f.-t.); Salzburg (f.-t.); Innsbruck (4 263).

VI. MAIN DIVISIONS.

Provinces of Upper Austria (divided between U.S. and Russian zones of occupation); Lower Austria (Russian zone); Burgenland (Russian zone); Salzburg (U.S. zone); Tirol and Vorarlberg (French zone); Carinthia, East Tirol, Styria (British zone); Vienna (divided into five sectors).

Denmark

DENMARK (3 72; map, 3-72) consists of the peninsula of Jutland and several islands lying at the entrance of the Baltic Sea. Although their land borders on Germany, the Danes are more closely connected by blood, customs, and traditions with Sweden and Norway. Denmark's prosperity is due to the thrift and industry of its people.

I. PHYSIOGRAPHY.

- A. **Peninsula of Jutland** : stormy barren west coast and protected smiling east coast.
- B. **Islands** large part of total area: Fyen, Zealand, Laaland, Falster, Moen, Bornholm.
- C. **Character of the surface** : low plains, woodlands, swamps.
- D. **Coastline** faces North Sea and Baltic.

II. CLIMATE.

Denmark is exposed to cold and damp winds, which bring an abundance of moisture.

III. NATURAL RESOURCES.

Farmland, pasture land, pottery clay, and fishing waters are the only natural sources of wealth; forestry is carried on scientifically.

IV. INDUSTRIES.

- A. **Agriculture** is the chief industry.
 - a. **Chief crops** : oats, rye, barley, potatoes, sugar-beet, hay.
 - b. **Importance of dairying.**
 - c. **Effective work of co-operative societies.**

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- B. Fisheries :** Cod, salmon, shrimp, lobster, haddock, herring, flounder.
C. Manufacture of porcelain.

V. CHIEF CITIES.

Copenhagen (capital) (2 500) , Aarhus and Aalborg (3 72) ; Odense (3 741 illus.)

VI. POSSESSIONS OF DENMARK.

- A. Faroe Islands (3-75).** These islands, lying

about midway between Scotland and Iceland, enjoy local autonomy, they send representatives to the Danish parliament. Chief industries fishing and sheep raising

- B. Greenland (4 94).** This, the largest island in the world, is a province of Denmark, until 1953 it was a colony. Population mostly Eskimos. Chief industries : fishing, seal hunting, trapping, cryolite mining.

Iceland

ONCE belonging to Denmark, the North Atlantic island of Iceland (4 233, map, 4 234) became an independent republic in 1944. Reykjavik (4 233), the capital, is the only town of any size

I. PHYSIOGRAPHY.

- A. Mountainous Plateau :** volcanic rocks, with glaciers and snowfields, comprise most of the island. Chief volcano is Hekla
B. Lowlands amounting to only one fifteenth of total area, in S and S.W. Unproductive and sandy
C. Coasts : rugged high cliffs, with deep fjords affording harbour

II. CLIMATE.

Iceland has an Arctic climate, cold and stormy,

but modified by prevailing S.W. winds and warm Atlantic drift

III. NATURAL RESOURCES

fish in great quantities, hot water geysers, many swift mountain streams providing water power, small deposits of lignite and sulphur, Iceland spar

IV. INDUSTRIES.

- A. Fisheries.** Cod the chief fish, salmon and trout in inland waters
B. Agriculture : rearing of ponies, sheep, and cattle, dairying.

Sweden and Norway

THE Scandinavian Peninsula (map, 5 463), occupied by Sweden and Norway, is attached to the rest of Europe by a comparatively narrow neck in the extreme north, boundary here between Scandinavia and U.S.S.R. is formed partly by the Munio and Pina rivers. Norway has on the whole a warmer, moister climate than Sweden, with ice free ports. The Baltic Sea harbours of Sweden are ice locked throughout the winter. This makes the Norwegian people a more important seafaring nation than the Swedish, but excessive rains, combined with poor soil, keep the agricultural development of Norway far behind that of Sweden.

I. SWEDEN (7 200).

A. Physiography.

- a. Separated from Norway by Kjolén Mts.
- b. Divided into three natural regions. Gota land, a fertile region in the extreme south, Svealand, a middle region of lakes and hills, Norrland, a northern region of vast forest-covered mountains, includes part of Lapland.
- c. Coastline irregular, rocky in places, sandy in others; part of southern coast faces the Kattegat branch of the North Sea.

- B. Climate.** Summers in Sweden are short, winters are long. The extremes of temperature are greater than in Norway. The mountains also cut off much of the moisture carried by winds from the North Sea.

C. Natural Resources.

- a. Fertile soil in the south.

- b. Fish plentiful in Baltic and inland waters.
- c. Forests and mineral deposits
- d. Navigable rivers and water power.

D. Industries.

- a. Agriculture is the most important industry. Chief crops are oats, rye, barley, potatoes, and sugar beet.
- b. Lumbering and mining (iron, copper, silver, lead, zinc, sulphur pyrites).
- c. Fisheries.
- d. Manufacturing. chief products are matches, furniture, wood pulp, paper, porcelain, glass, textiles, iron and steel products, sugar.
- e. Transport: railways, rivers, canals, and sea shipping.

- E. Chief Cities :** Stockholm (capital) (7-158) ; Göteborg, Malmö, Norrköping, Helsingborg.

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II. NORWAY (5-462).

A. Physiography.

- a. Separated from Sweden by the Kjolén Mts.
- b. Nearly all Norway covered with rugged mountains and plateaux.
- c. Coastline broken by countless fjords and bordered with small islands.
- d. The North Sea and the Skagerrak.
- e. Spitsbergen Islands (Svalbard) (7-137).

B. Climate. The temperate ocean winds and the effect of the Gulf Stream (4-105) help to make the climate of Norway milder than that of Sweden and the lands farther east. The winters, however, are long and the summers short. The northern third of Norway lies inside the Arctic Circle.

C. Natural Resources.

- a. Great forests of pine and fir.
- b. Fish plentiful in coastal waters.

c. Some minerals (iron, copper, zinc, lead, silver); immense coal deposits on Spitsbergen Islands.

- d. Agricultural land confined to small valleys.
- e. Water-power; countless natural harbours.

D. Industries.

- a. Fisheries: cod, herring, mackerel, salmon; whaling.
- b. Lumbering and lumber products.
- c. Agriculture: oats, rye, barley, potatoes.
- d. Stock raising and dairying; reindeer are raised in the extreme north.
- e. Manufacturing: chemicals, machinery, woodenware.
- f. Transport. Norway is one of the important shipping countries of the world.

E. Chief Towns. Oslo (capital) (6-7); Bergen; Trondhjem; Stavanger; Narvik; Hammerfest.

Finland

FROM the 13th to the 18th century a possession of Sweden, and from 1809 to 1917 a grand duchy of tsarist Russia, Finland (3-353) is one of the new countries created after the First World War. During the Second, Finland fought and was defeated by the Soviet Union, losing some territory in the peace settlements of 1940 and 1947.

I. PHYSIOGRAPHY.

- A. Plateau,** rising in the north, covers most of the country; surface is marshy and pitted with thousands of lakes.
- B. Coastline:** indented, low, and island-fringed, with narrow coastal plain.

II. CLIMATE.

Long, cold winters; short, hot summers.

III. RESOURCES AND PRODUCTS.

- A. Forests:** over half the land area; timber, wood-pulp and paper; shipbuilding.
- B. Grazing land:** cattle, sheep, goats, pigs, horses, reindeer, chief crops are oats, barley, rye, potatoes.
- C. Fisheries:** herring, seal, salmon, trout
- D. Water-power,** from many short rivers.

IV. CHIEF TOWNS.

Helsinki (capital) (4-160); Turku; Oulu; Tampere

Poland

THE name Poland (6-238; *maps*, 6-238, 239) has stood for very different areas at different periods of history. From 1795 no country of the name appeared on the map until Poland was recreated in 1918-21 from parts of Germany, Austria, and Russia. Reoccupied by Germany and Russia in 1939, Poland re-emerged as a separate country, but with different boundaries, in 1945.

I. PHYSIOGRAPHY.

- A.** Part of great central lowland of Europe.
- B.** Much of the land is marshy and dotted with lakes
- C.** Carpathian Mountains on southern boundary.
- D.** Vistula river and its tributaries drain most of Poland.
- E.** Coastline on the Baltic Sea.

II. CLIMATE.

Winters are long; springs are rainy; summers are dry and often extremely hot.

III. RESOURCES AND PRODUCTS.

- A. Agriculture:** rye, oats, wheat, barley, sugar beet, potatoes, hemp, and hops.
- B. Minerals and mining:** coal, iron, zinc, tin, copper, sulphur.
- C. Manufacturing:** textiles, leather and leather goods, lumber and wood products, metal products, beet-sugar.

IV. CHIEF CITIES.

Warsaw (capital) (7-419); Lodz (6-238); Danzig (Gdansk) (3-48);

Czechoslovakia, Hungary, and Rumania

THESE three countries are sometimes called the Central European States. The first two came into separate existence as a result of the First World War, having formerly been parts of Austria-Hungary; the third gained its independence by the treaty of Berlin, 1878. All three countries lie, in whole or in part, in the great Danube Basin.

I. CZECHOSLOVAKIA.

Czechoslovakia (3-21; map, 3-22) is made up of the former Austrian provinces of Bohemia (1-503), Moravia, and Slovakia. These historic provinces were abolished 1949, and the country was divided into 19 regions, each named after its chief town.

A. Physiography.

a. **Mountains and highlands:** Moravian Hills, Bohemian Forest (Böhmer Wald), Ore Mountains (Erzgebirge), Giant Mountains (Riesengebirge), Carpathian Mountains.

b. **Rivers:** Head waters of Elbe; Danube on southern boundary, and tributaries of Danube.

B. **Climate.** Abundant rainfall; cold winters and hot summers.

C. Resources and Products.

a. **Timber and timber products.**

b. **Agriculture:** wheat, rye, barley, oats, potatoes, beets, hops.

c. **Minerals and mining:** coal, iron, graphite, silver, copper, lead, salt.

d. **Manufacturing:** Textiles, glass, furniture, machinery, paper, chemicals, beet-sugar, beer.

D. **Capital and chief city:** Prague (6 279).

II. HUNGARY (4 205).

A. Physiography.

a. **Slopes of Carpathians** form northern boundary.

b. **Great Hungarian Plain (Alföld)** covers remainder of Hungary and extends eastward into Rumania and southward into Yugoslavia.

c. **Chief Rivers:** Danube flowing across central Hungary, Theiss (or Tisza) in the east, Drava on the southern boundary (map, 4 205).

B. **Climate.** Hungarian Plain has less moisture than surrounding highlands, but rainfall is most abundant in the late spring, which favours the early growth of crops, while the late summer is hot and dry, which helps the crops to ripen; the winters are extremely cold.

C. Resources and Products.

a. **Agriculture:** the Hungarian Plain is the richest agricultural region in Europe. Chief

crops: wheat, rye, barley, oats, corn, sugar-beet, hops, grapes, tobacco, flax.

b. **Stock and horse raising; Dairying.**

c. **Minerals and mining:** coal, iron, and bauxite.

D. **Chief City:** Budapest (capital) (2 105).

III. RUMANIA (6-469).

A. Physiography.

a. **Mountains:** southern spurs of Carpathian Mountains including Transylvanian Alps.

b. **Uplands of Transylvania** west of mountains.

c. **Strip of Hungarian plain** on western border.

d. **Lowland plain** in east and south comprising lower Danube basin and stretching to Black Sea. This is the south-western tip of the Russian plain, which forms a part of the Great Central Lowland of Europe.

e. **Rivers:** Danube and its tributaries the Prut (boundary with U.S.S.R.) and Seret.

B. **Climate.** Mountains and western slopes have typical Central European climate; eastern plains suffer from extremes of heat and cold.

C. Resources and Products.

a. **Agriculture:** wheat, rye, barley, oats, maize, beans, potatoes, sugar-beet, tobacco, grapes and other fruit.

b. **Timber and timber products.**

c. **Minerals and mining:** coal, salt, silver, iron, lead, copper, and marble.

d. **Important petroleum fields.**

D. **Chief Cities:** Bucharest (capital) (2-102); Jassy, Constanta.

LIECHTENSTEIN.

This principality (4 491) of 62 square miles lying between Austria and Switzerland, and formerly dependent upon Austria-Hungary, was given its independence in 1918. Chief products of the principality are: grain, wine, fruit, timber, livestock, cotton goods, leather, and pottery.

Spain and Portugal

THE Iberian Peninsula (map, 7 104), which is occupied by Spain and Portugal, is cut off from France and the rest of Europe by the formidable wall of the Pyrenees. The coastline has few natural harbours large enough to accommodate modern ships, and most of the rivers are rushing mountain streams unfit for navigation. The interior is a high rough plateau, criss-crossed by lofty ridges that interfere with transport from one part of the peninsula to the other, and with climate and soil unfavourable to agriculture. Portugal, with a long seaboard on the Atlantic, has a more favourable climate and a more productive soil than has Spain.

I. SPAIN (7-103).

A. Physiography.

a. **Mountains:** Pyrenees (6-313); Cantabrian Mountains; Sierra Nevada (*f.i.*); Sierra Morena.

b. **Central Tableland or Plateau.**

c. **Valleys and Lowlands.** Valley of the Ebro; a narrow strip on the Gulf of Valencia; the valley of the Guadalquivir broadening out on the Gulf of Cadiz.

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- d. Guadalquivir and Ebro are the only navigable streams.
- e. Smooth Coastline with few natural harbours.
- f. Balearic (1-349) and Canary (2-207) Islands.

B. Climate. The rainfall on the Atlantic coast is extremely heavy; it is lighter on the Mediterranean coast; and in many parts of the mountain-crossed interior semi-desert conditions prevail. Extremes of heat and cold exist in the interior, but on the coast the climate is much milder.

C. Resources and Products.

- a. **Agriculture** : wheat, barley, oats, rye, maize, beans, peas, sugar-beet, grapes, olives, oranges, lemons, flax, hemp. Irrigation is important.
- b. **Stock Raising** : sheep, goats, pigs, poultry, cattle, horses, mules, asses.
- c. **Minerals and mining** : coal, iron, lead, copper, mercury, zinc, sulphur, potash, salt.
- d. **Fisheries** : sardines, tunny.
- e. **Manufacturing** : cotton goods, woollens, wine, leather, paper, glass, cork, lumber.
- f. **Large but little developed sources of water-power.**

D. Chief Cities : Madrid (capital) (5 70); Barcelona (1-367); Valencia (7-373); Seville (7-5).

E. Spanish Possessions : Rio de Oro and Spanish Guinea, on West Coast of Africa.

II. PORTUGAL (6-267).

A. Physiography. Portugal has mountains inland, small lowland areas on the coast. Its principal rivers, the Douro and the Tagus, are navigable. Azores (1-330); Madeira (Funchal) (5 65).

B. Climate. Being more exposed to the tempering winds of the Atlantic, Portugal has on the whole a milder and moister climate than Spain.

C. Resources and Products.

- a. **Agriculture** : wheat, maize, oats, rye, barley, grapes, olives, figs, tomatoes, oranges, onions, nuts, potatoes.
- b. **Stock Raising** : sheep, goats, cattle, pigs.
- c. **Forests** : cork and other forest products are among the chief sources of wealth.
- d. **Minerals** : coal, copper, manganese, lead, tin, kaolin, sulphur, gold.
- e. **Fisheries** : sardines, tunny, cod.
- f. **Manufacturing** : wine, cork and cork products, resin and turpentine, olive oil.

D. Chief Cities : Lisbon (capital) (4 521); Oporto.

E. Overseas Provinces.

- a. **Atlantic** : Cape Verde Islands (2-218); St. Thomas and Principe.
- b. **Africa** : Portuguese Guinea; Angola; Mozambique.
- c. **Asia** : Portuguese India (Goa, Daman, Diu); Macao, part of Timor Island.

ANDORRA (1 149).

This tiny semi-independent republic lies in the Pyrenees between Spain and France. Area 191 square miles; population about 5,000.

Italy

ITALY (4 304; map, 4 305), with its commanding position in the Mediterranean Sea, dominated the world in the days when the Mediterranean was the centre of civilization in Europe. Its beauty, its history, and its art treasures still give it great importance.

I. PHYSIOGRAPHY.

A. Mountains.

- a. **Alps** along the northern boundary (1 120).
- b. **Apennines** form backbone of peninsula (1 180).
 - 1. Highlands of Sicily are part of same land formation as the Apennines.
 - 2. **Volcanoes** : Vesuvius (7 395); Etna (3 303).

B. Lowlands. These include the plains of Lombardy and the valley of the Po, the plains of Tuscany, the Roman Campagna, and coastal plains along the Tyrrhenian and Adriatic Seas.

C. Chief Rivers : Po (6-231); Tiber (7 272); Adige (4 304); Arno (4 304).

D. Principal Lakes : Maggiore and Como (4 304).

E. Islands : Sicily (7-49); Sardinia (6 499).

II. CLIMATE.

The Alps shelter the northern plain, but at times a cold wind (the Tramontana) blows down from their snow-covered heights. The summers are hot throughout the peninsula; except in the higher mountain regions the winters become increasingly mild towards the south. Rainfall, in the winter, is usually plentiful.

III. NATURAL RESOURCES.

A. Good Soil and Forests.

B. Minerals. With the exception of marble, the mainland of Italy contains little mineral wealth. Sardinia provides iron, zinc, and lead; Sicily yields sulphur.

C. Water-power.

IV. INDUSTRIES.

A. Agriculture : wheat, maize, potatoes, sugar beet, grapes, olives, oats, beans, rice, barley, rye, lemons, oranges, tomatoes.

B. Stock Raising : sheep, cattle, goats, pigs, horses, mules, asses.

C. Mining and Quarrying : sulphur, marble, iron, zinc, lead, mercury, manganese.

D. Fisheries : tunny, sardines, coral.

E. Manufacturing : silk, cotton, and artificial silk goods; wines, olive oil, hemp, hats, rubber, leather; motor-cars, iron and steel products, pottery, glass, paper, chemicals, sugar, macaroni, soap.

V. CHIEF CITIES.

Naples (5-317); Milan (5-204); Rome (capital) (6 427); Turin (7 331); Palermo (7 49); Genoa

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(3-512); Florence (3-392); Bologna (1-510); Venice (7-387); Ravenna (6-367); Pisa (6-207).

TERRITORY UNDER U.N. TRUSTEESHIP.
Somalia, or Italian Somaliland (7-84).

SAN MARINO (6-497).

This is a small independent republic, area 38 square miles, completely surrounded by Italian territory.

Yugoslavia, Bulgaria, Albania, Greece

OCCUPYING the Balkan Peninsula (1-349) and adjacent territory, these four countries are called the Balkan States. Their history has been one of strife and confusion, much of which can be explained in geographical terms. Their position in relation to the Near East and Russia has involved them in intense political intrigues.

I. YUGOSLAVIA.

This state, recognized in 1919 as the kingdom of the Serbs, Croats, and Slovenes, took the name Yugoslavia (7 517; *map*, 7-518) in 1931. It consists of Serbia (6-532); Montenegro (5-250); Bosnia and Herzegovina (2-20), and other lands previously belonging to Austria-Hungary. The northern boundary extends into the Hungarian Plain.

A. Physiography.

- a. **Mountains.** All of Yugoslavia, except the northern strip of the Hungarian Plain, is covered with rugged forested highlands and mountains, including the Dinaric Alps.
- b. **Lowlands.** The valleys of the Sava and the Drava and part of the Danube valley.

B. Climate. The climate, particularly on the southern mountain slopes, is mild. Extremes of cold are found only in the highest interior ranges. Rainfall is plentiful along the coast and in the foothills to the north, but scanty in some of the enclosed tablelands.

C. Resources and Products :

- a. **Agriculture :** wheat, barley, oats, maize, potatoes, rye, sugar-beet, hops, tobacco, fruit (particularly grapes and plums), hay.
- b. **Stock Raising :** sheep, goats, cattle.
- c. **Minerals and mining :** coal, iron, bauxite, copper, lead, zinc, antimony, manganese, mercury, salt.
- d. **Manufacturing :** flour, beer, wines, sugar, wood products.

D. Chief Cities : Belgrade (capital) (1-422); Zagreb (Agram) (7-518); Split (Spalato) (3-28).

II. BULGARIA.

A. Physiography. The Balkan Mountains lie across the middle of Bulgaria (2 119) from west to east. To the north is a lowland plain extending to the boundary, which is part of the Danube valley. South of the Balkan Mountains are highlands surrounding a strip of plain which extends to the Black Sea (1-480).

B. Climate. Generally mild with cold winters in the mountains of the interior.

C. Resources and Products :

- a. **Agriculture :** wheat, maize, rye, tobacco, grapes and other fruit, sugar-beet, roses.
- b. **Stock Raising :** sheep, cattle, goats.
- c. **Minerals and mining :** coal, iron, bauxite, salt.
- d. **Manufacturing :** tobacco, wine, perfumes.

D. Chief Cities : Sofia (capital) (7-82); Plovdiv.

III. ALBANIA.

A. Physiography. Rugged mountains lie behind the narrow strip of coastal plain on the Adriatic that forms Albania (1 91).

B. Climate. Extremely mild, except in the highest mountain regions, where the winters are severe.

C. Resources and Products :

- a. **Agriculture :** wheat, maize, tobacco, olives.
- b. **Stock Raising :** sheep, goats, cattle.
- c. **Minerals :** coal, copper, chromite, salt.
- d. **Manufacturing :** olive oil, flour, cement.

D. Chief Cities : Tirana (capital); Shkoder (Scutari); Durres (Durazzo).

IV. GREECE

A. Physiography.

a. **Mountains and Plains.** All of Greece (4 71, *map*, 4-72) is criss-crossed by ranges of low mountains and hills, with small valleys and plains between. The **Pindus Range** extending down from the north-west border, is the most important of the mountain systems.

b. **Coastline.** Marked by countless gulfs and peninsulas, among which the most important are the Gulf of Corinth and the Peloponnese, or Morea.

c. **Surrounding Islands :** Crete (2 527), Sporades and Cyclades; Ionian Islands (4-78); Dodecanese (1-25).

B. Climate. Temperate, with moist winters and dry summers.

C. Resources and Products :

a. **Agriculture :** wheat, maize, barley, grapes, currants, olives, oats, tobacco, cotton, oranges, lemons, rice, figs, nuts.

b. **Stock Raising and Dairy Products :** sheep, cattle, cheese.

c. **Minerals and mining :** iron, lead, magnesite, chromite.

d. **Manufacturing :** olive oil, wines, textiles.

e. **Sponge Fishing.**

D. Chief Cities : Athens (capital) (1 287); Salonika (Thessaloniki) (4 79; 7-483); Piraeus (port of Athens) (1-287).

TURKEY IN EUROPE. Of its former possessions in Europe, Turkey retains control only of Istanbul (4-303) and Edirne (Adrianople), with Chatalja and Eastern Thrace, totalling about 9,000 square miles.

GEOGRAPHY

Russia-in-Europe

RUSSIA (6-472; map, 6-476), last of the European states to come under the influences of western civilization, belongs as much to Asia as it does to Europe. This Outline deals only with European Russia, that is, the part of the Union of Soviet Socialist Republics west of the Ural Mountains; for Asiatic Russia, see page 102 in this volume.

I. PHYSIOGRAPHY.

- A. Most of Russia is a great lowland plain.**
 - a. The fertile "Black Belt."
 - b. Steppes and barren tundras.
- B. Mountains :**
 - a. Low Ural Mountains on the east.
 - b. Rugged Caucasus Mountains in south.
- C. Rivers, Lakes, and Inland Seas.**
 - a. Volga, largest river in Europe (7-405).
 - b. Lake Ladoga, largest lake in Europe (f.i.).
 - c. Black Sea (1-480); Caspian Sea (2-256).

II. CLIMATE.

Russia has a wide variation in temperature between winter and summer, dry winds, and uncertain rainfall. The Russian plains extend from the frozen Arctic Zone to the temperate regions of the south.

III. RESOURCES AND PRODUCTS.

- A. Agriculture and Stock Raising.**
 - a. Great areas of extremely fertile soil.
 - b. Chief Crops : wheat, rye, oats, barley, cotton, potatoes, flax, hemp, sugar-beet, tobacco, rice.
 - c. Livestock : sheep, cattle, horses, pigs, goats.
- B. Forests and Timber Products.** Lumber, wood-pulp, tar, turpentine, resin.
- C. Fish and Fisheries.** Chief products of fisheries are salmon and sturgeon, the latter yielding caviare and isinglass.
- D. Minerals and mining.** Coal, platinum, petroleum, iron, manganese, cobalt, sulphur, mercury, copper, zinc, gold, silver, iridium, lead, asphalt, peat, precious stones.
- E. Manufactures.** Iron and steel products, machinery, cement, textiles, furs, hides, chemicals, paper, sugar, shoes.

IV. TRANSPORT.

- A. River and Canal Transport.**
- B. Railways.** There are some 30,000 miles of railway in operation in European Russia.

V. MAIN DIVISIONS.

- A. The western part of the R.S.F.S.R. (Russian Soviet Federal Socialist Republic).**
 - a. Products : in the north, reindeer, furs, fish, timber; in the centre, cereals, cattle; in the south, wine, tobacco, cotton. Coal, oil, iron, copper, precious metals and stones, salt, etc., are found throughout the Republic, especially in the Urals.
 - b. Chief Cities : Moscow (capital) (5-268); Leningrad (4-479); Gorky (6-472); Rostov (6-472, 7-491, 493); Stalingrad (7-142).

- B. Ukraine (6-479), in the south-west, was devastated during the Second World War.**
 - a. Products : coal and iron (Donetz basin), chemicals in the south; sugar-beet in the central steppes; cereals and cattle.
 - b. Chief Cities : Kiev (capital) (4-403); Kharkov (f.i.); Odessa (5-499); Dnipropetrovsk (f.i.); Stalino; Lvov (f.i.).
- C. White Russia (Byelorussia), in the west (6-479).**
 - a. Products : flax, potatoes, hemp; cattle, pigs, timber, dairy and engineering products.
 - b. Chief Cities : Minsk (capital) (f.i.); Vitebsk (f.i.); Gomel.
- D. Moldavia, in the south-west (6-478).**
 - a. Products : wheat, maize, barley, sunflower seed; fruit, including grapes; sturgeon, mackerel, brill; wine, perfumes.
 - b. Capital : Kishinev.
- E. Estonia (3-298; 6-477).**
 - a. Products : rye, oats, barley; butter, timber products, including matches and furniture.
 - b. Capital : Tallinn (or Reval).
- F. Latvia (4-453; 6-478).**
 - a. Products : flax, oats, barley, potatoes; timber products, chemicals, textiles; amber.
 - b. Capital : Riga (6-402).
- G. Lithuania (4-523; 6-478).**
 - a. Products : rye, oats, wheat, barley, flax, dairy products; timber and wooden goods, agricultural machinery.
 - b. Chief Cities : Vilnius or Vilna (capital). Kaunas (Kovno).
- H. Karelian A.S.S.R., in the north-west (6-477), bordering Finland (see also 8-367).**
 - a. Products : timber, wood-pulp, paper.
 - b. Capital : Petrozavodsk.
- I. Azerbaijan, in Caucasus (6-477).**
 - a. Products : grain, cotton, wine, tea, tobacco, silk; cattle; petroleum, copper, bauxite, sulphur, salt.
 - b. Capital : Baku (1-348).
- J. Georgia, in Caucasus (3-524; 6-477).**
 - a. Products : tea, citrus fruits, bamboo, tobacco, grapes, silk, wine; manganese, coal, baryta, marble.
 - b. Chief towns : Tbilisi or Tiflis (capital). Batumi.
- K. Armenia, in Caucasus (1-243; 6-477).**
 - a. Products : wine, tobacco, grain, sugar-beet, cotton, almonds, figs and other fruits; cattle, marble, molybdenum, fertilisers, cement, pumice stone; carpets, textiles.
 - b. Capital : Erivan (1-242).

GEOGRAPHY

AFRICA

AFRICA (1-49; *maps*, 1-52, f.p. 53), second in size of the continents (after Asia), is the most backward. The Nile valley once developed a great civilization (that of ancient Egypt), and is still highly cultivated; but the greater part of Africa lies within the Tropics, and is subject to stifling heat and debilitating diseases. Some Negro tribes in the interior still live the life of primitive savages, though the number of those who have had no contact with the white man is rapidly diminishing. The presence in this continent of about 40 million white men, and nearly five times as many slowly awakening black men, has posed social and moral problems that have still to be solved.

I. POSITION AND AREA.

Africa extends an equal distance north and south of the Equator. With its area of 11,699,000 square miles, it is about three times as large as Europe and contains one-fifth of the globe's land surface.

II. PHYSIOGRAPHY.

A. The great mass of Africa consists of a High Tableland surrounded by narrow Coastal Plains.

B. Former land connexion with Europe.

C. Mountains and Highlands. Most of the higher mountain ranges are on or near the sea coast.

a. Atlas Mountains in the north-west (1-109).

b. Highlands of the East. These include the tableland of Nubia, the Abyssinian Mountains, and the East African Ranges. The last, mostly of volcanic origin, contain Kilimanjaro, the highest peak on the continent, the "Great Rift Valley," and Ruwenzori.

c. South African Highlands.

D. Lowlands. Congo lowland; narrow coastal lowlands.

E. Forests, Grasslands, and Deserts:

a. Great forests of Central Africa.

b. Savanna region of the Sudan north of the great forests.

c. Veld region to the south.

d. Sahara Desert (6 484), the largest arid waste in the world. The Libyan Desert, the Nubian Desert, and the Arabian Desert are eastern continuations of the Sahara.

e. Kalahari Desert in South Africa.

F. Chief Rivers and Lakes:

a. Nile, the only large African river flowing into the Mediterranean (5 439).

b. Congo and its vast basin (2 480).

c. Niger (5 434); Zambezi (7 521) and Victoria Falls (7 397).

d. Lake Chad; Victoria Nyanza (7 397);

Lake Tanganyika (7-221); Albert Nyanza; Albert Edward Nyanza; Lake Nyasa (4 527).

G. Coastline is unbroken—few natural harbours. Coasts on Mediterranean Sea (5-166); Red Sea (6-375); Indian Ocean (4-255); Atlantic Ocean (1-292); Cape of Good Hope.

H. Islands off the Coast of Africa:

a. Madagascar, the only large island (5 64).

b. Small islands in the Atlantic: Madeira Islands (5 65); Canary Islands (2 207). Cape Verde Islands (2 218). Ascension (*f.i.*).

c. Small islands in the Indian Ocean: Zanzibar and Pemba (7 521); Mauritius (5 149), Comoro Islands, Réunion, the Seychelles.

III. CLIMATE.

A. Hot Equatorial Climate modified in places by altitude.

B. Climate of the Mediterranean Coast.

C. Desert Climate.

D. Bracing Climate of South Africa.

E. Rainfall. Heavy in tropical forest areas; moderate in south; absent in Sahara.

IV. MINERAL RESOURCES OF AFRICA.

A. In North Africa: petroleum, copper, antimony, iron, lead, zinc, sulphur, manganese, phosphates, mercury.

B. In East Africa: coal, iron, lead, copper.

C. In South Africa: gold, diamonds, copper, coal, iron, tin, lead, silver, uranium.

D. In West Africa: coal, tin, lead, gold, silver, uranium, diamonds, bauxite.

V. VEGETABLE AND ANIMAL LIFE.

A. Typical Vegetation of Africa: monkey-bread tree or baobab (*f.i.*), mangrove (5 113); ebony (3-156); cypress (3 20); lotus (5 40), papyrus plant (6 71); elephant grass, date palm (6 59 illus.); oil palm (6 50); bamboo (1 359); groundnut (4 98); banana (1 359).

B. Typical Animals of Africa: aardvark (1 2); leopard (4 484); lion (4 520); elephant (3 225); hippopotamus (4 179); rhinoceros (6-392); monkey (5 240); baboon (5 241) and mandrill (5 242); chimpanzee (2 360); gorilla (4 48); buffalo (2-109); camel (2 183); giraffe (4 21); wild ass (1-275); zebra (7 522); eland and other antelopes (1-170); wart hog (7 420); crocodile (2 532); cobra (2-436); horned viper (6 296); ostrich (6-8); guinea fowl (4-104); tsetse fly (7-323); termites (7-259).

Divisions of Africa

I. NORTHERN AFRICA.

A. Egypt (3-172; *map*, 3-174), an independent sovereign state.

a. Chief Products: cotton, wheat, barley, maize, millet, rice, sugar, clover, petroleum, cotton and silk goods, morocco leather, pottery.

b. Chief Cities: Cairo (capital) (2-163); Alexandria (1-101); Port Said; Assiut (*f.i.*); Suez (3-176); Darnietta (*f.i.*).

B. Republic of the Sudan (7-179); former Anglo-Egyptian Sudan.

a. Chief Products: gum arabic, ivory, cotton, ostrich feathers, palm nuts, dates, sesame, hides, skins.

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- b. Chief Towns :** Khartum (4-402); Omdurman.
- C. Libya (4-488),** independent kingdom (from 1952; Italian 1912-1942).
- a. Chief Products :** dates, olives, lemons, figs, grapes, cereals, saffron, almonds, bananas, barley, cattle, sponges.
- b. Chief Towns :** Tripoli and Benghazi (joint capitals).
- D. Tunisia (7-324; map, 1-109) :** former French protectorate, independent since 1956.
- a. Chief Products :** olives, wheat, barley, oats, grapes, dates, almonds, oranges, lemons, pistachios, alfalfa-grass, henna, cork; sheep, goats, cattle; sardines, tunny, sponges; lead, zinc, iron, phosphate.
- b. Chief Towns :** Tunis; Sfax; Suse; Kairuan.
- E. Algeria (1 108; map, 1 109) :** part of Metropolitan France.
- a. Chief Products :** wheat, barley, oats, maize, potatoes, artichokes, beans, peas, tomatoes, flax, tobacco, wine, fruits, olive oil, cork; sheep, goats, cattle; sardines, anchovies, tunny; iron, lead, zinc, coal, kaolin.
- b. Chief Cities :** Algiers (1 109); Oran; Constantine.
- F. Morocco (5 264; map, 1-109) :** independent since 1956; formerly part French, part Spanish.
- a. Chief Products :** barley, wheat, beans, linseed, olives, dates, almonds, figs; sardines, tunny; sheep, goats, cattle, horses; phosphate, iron, anthracite, manganese.
- b. Chief Cities :** Marrakesh (5 265 illus.); Fez (*f.i.*; 5 265 illus.); Tangier (7 222).
- G. Rio de Oro and Ifni (Spanish).**
- a. Products :** This colony is virtually desert land, without important products.
- b. Capital :** Villa Cisneros.
- ### II. EAST AFRICA.
- A. Abyssinia (or Ethiopia) (1 5),** independent kingdom.
- Resources and Products :** hides, skins, coffee, wax, ivory, civet, barley, millet, wheat, tobacco; iron, gold, coal, silver, sulphur; timber. Capital: Addis Ababa.
- B. Somaliland (7-84).**
- a. Somalia** (administered by Italy under U.N. trusteeship). Chief industries: cattle raising, agriculture. Chief town: Mogadishu.
- b. British Somaliland.** Chief products: skins, hides, gum, resin, cattle, sheep. Chief town: Hargeisa.
- c. French Somaliland.** Chief products: coffee, ivory, hides, skins, salt. Chief town: Jibuti.
- C. British East Africa (2-84).**
- a. Kenya Colony and Protectorate.** Products: cotton, wheat, maize, coffee, sisal-hemp, pyrethrum, tea, wattle bark; butter, hides and skins. Chief towns: Nairobi (capital); Mombasa.
- b. Uganda (protectorate).** Products: cotton, coffee, oil-seeds, sugar, tobacco, ivory. Capital: Entebbe.
- c. Tanganyika Territory** (held under U.N. trusteeship). Products: coffee, cotton, oil-seeds, sisal-hemp; hides and skins, beeswax; timber. Capital: Dar-es-Salaam.
- d. Islands of Zanzibar and Pemba (7-521).** Products: cloves, coconuts (copra), hides, pottery, coir-fibre, coconut oil, rope, soap, oil cake, jewelry, mats. Chief city: Zanzibar.
- D. Mozambique (Portuguese East Africa) (6-268).**
- a. Chief Products :** sugar, coconuts, beeswax, ivory, gold, coal, uranium.
- b. Chief Towns :** Mozambique; Lourenço Marques; Beira.
- ### III. WEST AFRICA.
- Products typical of West Africa (7 440) are ebony and other hard woods, ivory, groundnuts, manioc, yams, gum, palm-oil and kernels, dyewoods, hides, skins, and feathers.
- A. French West Africa and the Sahara (6 485)**
- Capital: Dakar.
- a. Senegal.** Capital, St. Louis.
- b. French Guinea.** Chief town: Konakry.
- c. Ivory Coast.** Chief towns: Abidjan (capital); Grand-Bassam.
- d. Dahomey.** Chief town: Porto Novo.
- e. French Sudan (7 179).** Chief towns: Bamako (capital); Timbuktu.
- f. Mauritania and Niger Territory:** desert land, except for south Niger.
- g. Togoland, or Togo** (under U.N. trusteeship). Chief towns: Lomé; Anehoé.
- h. Cameroons** (under U.N. trusteeship). Chief town: Yaoundé.
- B. British West Africa (2 84).**
- a. Nigeria** (colony and protectorate: a self-governing federation). Capital: Lagos.
- b. Cameroons** (under U.N. trusteeship; administered with Nigeria). Chief town: Victoria.
- c. Gambia.** Capital: Bathurst.
- d. Sierra Leone** (colony and protectorate). Chief town: Freetown.
- e. Gold Coast** (includes part of former German Togoland under U.N.; since 1954 has all-African parliament). Capital: Accra.
- C. Spanish West Africa :** Spanish Guinea (Rio Muni) and Fernando Po.
- D. Portuguese Guinea (6-268).** Capital: Bissau.
- E. Liberia (4 485),** an independent Negro republic under United States protection. Capital: Monrovia.
- ### IV. MIDDLE AFRICA.
- A. French Equatorial Africa (2-482).**
- a. Products :** palm-oil, ivory, coffee, cotton, copal; livestock; copper, zinc, lead, diamonds; timber.
- b. Chief Towns :** Port Gentil; Libreville.

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- B. Belgian Congo (2-481).**
a. Products : rubber, palm kernels, palm-oil, coffee, cotton, uranium, gold, diamonds, copper, iron, tin, radium, cobalt.
b. Chief Town : Leopoldville (capital).
- C. Angola (Portuguese) (7 441)**
a. Products : coffee, wax, cocoa, tobacco, diamonds, salt, palm-oil and palm kernels, cotton, sisal.
b. Chief Towns : Sao Paulo de Loanda (capital), Benguela.
- V. CENTRAL AFRICAN FEDERATION (British).**
- A. Nyasaland (British protectorate) (6 395 ; 1 53).** Products : cotton, tobacco, coffee, tea, livestock. Seat of government : Zomba.
- B. Rhodesia (6 394)**
a. Products : cattle, sheep, goats, dairy-products, hides and skins ; gold, silver, copper, zinc, lead, coal, diamonds, maize, cotton, wheat, fruits ; timber.
b. Chief Towns : Salisbury (capital of colony of Southern Rhodesia) (6 489), Bulawayo (6 395), Livingstone (capital of protectorate of Northern Rhodesia).
- VI. SOUTH AFRICA (British).**
- A. Basutoland (1 1, 7 89).** Products : wheat, maize, sorghum, sheep. Chief town : Maseru.
- B. Bechuanaland (protectorate) (1 51, 7 89)** Products : cattle, sheep, goats, hides. Chief town : Serowe.
- C. Swaziland (protectorate) (7 89)** Products : asbestos, gold, cattle, tobacco, maize, sorghum, groundnuts. Capital : Mbatane.
- D. South-West Africa (7 89), administered by the Union of S. Africa.**
a. Products : cattle, sheep, goats ; karakul pelts (lambskins), diamonds, copper, tin.
b. Capital : Windhoek.
- E. Union of South Africa (7 88, map, 7 90).** This includes the provinces of Cape of Good Hope (2 215), Natal (5 325), Transvaal (7 308), Orange Free State (5 524)
a. Chief Products :
1. Agricultural : wheat, barley, oats, maize, potatoes, tobacco, tea, sugar, cotton, fruit.
2. Livestock : sheep, goats, cattle, pigs, horses, mules, asses, ostriches, butter, cheese, wool, mohair, hides, skins, ostrich feathers.
3. Minerals : gold, uranium, diamonds, coal, copper, tin, asbestos, manganese.
4. Manufactures : leather, chemicals, wine, furniture, vehicles, textiles, tinned foods.
b. Chief Towns : Cape Town (legislative capital of the Union, and capital of Cape Province) (2 217) ; Kimberley, Port Elizabeth, Pietermaritzburg (capital of Natal), Pretoria (administrative capital of the Union, and capital of Transvaal) (6 285), Johannesburg (4 377), Bloemfontein (capital of Orange Free State).
- VII. MADAGASCAR (French) (5 64)**
- A. Products :**
a. Agricultural : rice, sugar, coffee, manioc, beans, maize, potatoes.
b. Minerals : graphite, mica, precious stones, corundum.
c. Manufacturing : silk, cotton goods, straw hats, metal and food products.
B. Chief Towns : Antananarivo (capital), Tamatave.

ASIA

ASIA (1 264, maps, 1 268, f.p. 269), the giant of the continents, contains Mt. Everest, the highest peak in the world, and the Dead Sea basin, the lowest valley more than 1,000 feet below ocean level. It has the most extensive tablelands and the greatest area of lowland plains ; the bleakest and most barren desert and the most fertile and densely populated farm lands, regions of the severest cold and of the greatest heat. Asia is the home of more than half the human race, and out of Asia have come so many great contributions to human development that it is often called "the Mother of Civilization."

I. POSITION AND AREA.

The northern tip of Siberia lies nearly 600 miles inside the Arctic Circle, while the southern tip of the Malay Peninsula almost touches the Equator. Connected by land in the west to Europe and divided from Africa only by the man-made Suez Canal, the continent reaches in the extreme north-east to within 50 miles of America. One third of the land surface of the globe is included in Asia.

II. PHYSIOGRAPHY.

- A. Mountains and Interior Plateaux.**
a. Plateau of Asia Minor or Anatolia, and Taurus Mountains.
b. Elburz Mountains and Hindu Kush, marking northern boundary of the Iranian Plateau.
c. Great Pamir, meeting-place of Hindu Kush, Karakoram, and Tian Shan Ranges.
d. Himalaya Mountains, forming a vast wall between the central highlands and the plains of India. Mount Everest, the highest mountain in the world (3 319).
e. Plateau of Tibet between Himalayas and Kwenlun Mountains.
f. Plateau of Eastern or Chinese Turkestan between Tian Shan and Kwenlun Mountains.
g. Gobi Desert and Plateau of Mongolia between Altai, Yablonoi, and Khingan Mountains.
- B. Detached Ranges :**
a. Ural Mountains, on boundary of Europe.
b. Volcanic ranges on Pacific side extending through Kamchatka, Sakhalin, the Kurile Islands, the islands of Japan, the Korean peninsula, and Formosa.
- C. Lowland Plains and worn-down Tablelands :**
a. Arabian plateau and plains of Iraq.

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- b. Plains of India and the Deccan.
- c. Highlands and plains of Indo-China and Siam.
- d. Lowlands of Eastern China and Manchuria.
- e. Great Siberian plains and Siberian highlands.
- f. Lowlands of Western or Russian Turkestan.
- D. Chief Rivers and Lakes.
 - a. Rivers flowing into the Arctic Ocean : Ob, Yenisei, Lena.
 - b. Into the Pacific : Amur, Hwang, Yangtze.
 - c. Into the Bay of Bengal and Indian Ocean : Brahmaputra, Ganges, Irrawadi.
 - d. Into the Arabian Sea and Persian Gulf : Indus ; Tigris and Euphrates.
 - e. Lakes and Inland Seas : Caspian Sea (2-256) ; Sea of Aral (1-201) with its two rivers, Syr-Daria and Amu-Daria ; Lake Balkhash (*f.i.*) and Lake Baikal (*f.i.*).

III. CLIMATE.

- A. Great variety of Asiatic climate.
- B. High mountain ranges and interior plateaux suffer from extremes of heat and cold and from lack of well-distributed rain. The great " Desert Belt " stretching over from Africa.
- C. Siberia has dry steppes, frozen tundras, and rain-soaked eastern coast.
- D. Tropical climate with heavy rains in the south and south-east.
- E. Tremendous importance of monsoon winds to southern Asia.

IV. MINERAL RESOURCES.

Almost every known mineral is found in Asia ; development (especially in Asiatic Russia) is beginning.

V. VEGETATION AND ANIMAL LIFE.

- A. Typical Plants of Asia.
 - a. Siberia. Falls into three zones : (1) the Arctic tundras, where little grows except moss and lichens ; (2) the forest lands, where there is enough rain and warmth to

support pine, fir, larch, birch, willow, poplar ; and (3) the dry steppes, where grasses are the prevailing vegetation.

b. Central Highlands and Deserts. Except in rare sheltered valleys, desert oases, or the southern slopes of a few ranges, little vegetation or animal life is found here.

c. Temperate slopes of the Himalayas. The southern slopes of the great mountain barrier support a dense vegetation of trees and undergrowth. Typical forms are the rhododendron, magnolia, deodar, bamboo, cane.

d. Plains of India. Typical forms here are the babul, mango, banyan, plantain, betel palm.

e. Tropical South. Typical forms are teak, sandalwood, satinwood, ironwood, ebony, rosewood, bamboo, orchids, catechu plant, innumerable spice plants.

f. Eastern Coast. Coastal plains of China are so densely inhabited and so closely cultivated that there is virtually no wild vegetation.

B. Typical Animals of Asia.

a. Northern Zone : reindeer (6 379) ; polar bear and brown bear (1 390) ; seal (6 525) ; wolf (7-404) ; fox (3 426) ; badger (1 345) ; ermine (3-295) ; mink (5-221) ; otter (6 10) ; grey squirrel (7-140) ; hare (4 134) ; sable (*f.i.* ; 3-496).

b. Central and Southern Zone : monkey (5 240) ; elephant (3 225) ; rhinoceros (6 392) ; tiger (7-276) ; lion (4 520) ; leopard (4 484) ; Himalayan bear and sun bear (1-390) ; hyena (4-222) ; jackal (4-333) ; wild dog ; wild ass (1-275) ; camel (2 183) ; yak (7-511) ; buffalo (2-109) ; ibex (4-227) and other wild goats ; many species of wild sheep (7-20) ; antelopes (1-170) ; deer (3-59) ; wild boar (1-496) ; mongoose (5 239) ; squirrel (7-140) ; bats (1-380) ; hornbill (4 195) ; pheasant (6-153) ; peacock (6-100) ; weaver-bird (*f.i.*) ; crocodile (2-532) ; cobra (2 436) ; python (6-315) ; adjutant (1-20).

Asiatic Russia

THE Asiatic portion of the U.S.S.R. (6-472 ; map, 6-476) comprises the eastern half of the R.S.F.S.R. from the Urals to Vladivostok on the Pacific Ocean, and five Soviet Republics. Every type of climate and product is found, and development of mineral resources was speeded up during and after the Second World War when so much of European Russia was devastated by battle.

I. PHYSIOGRAPHY.

- A. Siberian Plains—divided into Arctic tundras, central timber lands, and southern steppes.
- B. Plains and Deserts of Western Turkestan.
- C. Mountains and Highlands :
 - a. Ural Mountains on the boundary between European and Asiatic Russia.
 - b. Eastern highlands ; Stanovoi Mountains.
 - c. Tian Shan, Pamir, Altai on southern border.
- D. Rivers : Ob, Yenisei, Lena, Amur.

E. Lakes and Inland Seas : Caspian Sea (2-256) ; Sea of Aral (1-201) ; Lake Baikal ; Lake Balkhash.

II. RESOURCES AND PRODUCTS.

- A. Agriculture : wheat, rye, oats, barley, vegetables, cotton, silk, tobacco, rice, etc.
- B. Stock Raising and Dairying : cattle, sheep, camels ; eggs, butter.
- C. Fishing : cod, herring, fresh-water fish.
- D. Timber and timber products.

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E. Minerals and Mining : coal, iron, petroleum, copper, lead, silver, gold, platinum, nickel, graphite, tungsten, tin, zinc, salt, mica, precious stones, radio-active ores, etc.

F. Fur Industry : seal, fox, ermine, mink, sable-marten, otter, grey squirrel.

G. Manufacturing : rugs, textiles, leather, machinery, paper, chemicals, tobacco.

III. ASIATIC R.S.F.S.R.

This part of the R.S.F.S.R. is divided into four territories (Altai, which includes the Gorno-Altai autonomous region, Krasnoyarsk, Khabarovsk, and Primorye), 11 regions (Sverdlovsk, Tiumen, Chelyabinsk, Kurgan, Omsk, Novosibirsk, Tomsk, Kemerovo, Irkutsk, Chita, and Sakhalin), three autonomous regions (Khakas, Gorno-Altai, mentioned above, and Tuva), and two autonomous soviet socialist republics (Buriat-Mongol and Yakutsk).

a. Products : as for Asiatic Russia generally, except that it has no sub-tropical products.

b. Chief Towns : Sverdlovsk ; Tiumen , Chelyabinsk ; Kurgan ; Omsk ; Novosibirsk ; Tomsk ; Kemerovo ; Irkutsk ; Chita.

IV. REPUBLICS IN CENTRAL ASIA.

A. Turkmenistan (6-478).

a. Products : cotton, wheat, fruit, wool, astrakhan fur, carpets ; sheep ; petroleum, salt, sulphur, soda.

b. Chief Towns : Ashkhabad (capital) ; Merv ; Kerki.

B. Uzbekistan (6-470).

a. Products : cotton, lucerne, food grains, grapes ; petroleum, building stone, copper, coal.

b. Chief Towns : Tashkent (capital) ; Bokhara ; Khiva ; Samarkand.

C. Tadzhikistan (6-478).

a. Products : cereals, cotton, fruit, cattle and sheep ; lignite, mercury, uranium, mica, sulphur.

b. Capital : Stalinabad.

D. Kirghizia (6-478).

a. Products : sugar, hemp, tobacco ; sheep, cattle ; coal, gold, silver, tungsten, etc.

b. Capital : Frunze.

E. Kazakhstan (6-477).

a. Products : coal, petroleum, sugar-beet, cotton, food grains, sheep.

b. Chief Towns : Alma Ata (the capital) ; Karaganda.

Japan

LESS than a century ago Japan (4-340, map, 4-341) was a closed state, having no interest in the outside world. Its people were satisfied with their own civilization, and cared nothing for that of the West. Then, as if by magic, all this was transformed. Within the span of one man's lifetime, Japan became a power in world politics and in world commerce. The Japanese created factories, a powerful navy, a large and efficient standing army. A victorious war with Russia, 1904-05, alliance with Great Britain, and a declaration of war on the side of the Allies in the First World War increased its strength. The conquest of Manchuria and the invasion of China followed, and in 1941 Japan bombed Pearl Harbour, forcing the United States of America into the Second World War. Japan surrendered in 1945, and was occupied by U.S. and British Commonwealth troops. In 1952 a peace treaty with former enemies (except Russia) came into force.

I. PHYSIOGRAPHY.

A. Volcanic Mountains.

a. Most prominent peak Mount Fujiyama (4-341, 346, illus.).

b. Earthquakes.

B. Important Lowlands.

C. Broken Coastlines provide many good harbours.

II. NATURAL RESOURCES AND PRODUCTS.

A. Agriculture : rice, tea, wheat, barley, rye, tobacco, fruit and vegetables, bamboo.

B. Mining and Minerals : iron, petroleum, aluminium, sulphur, kaolin clay, coal (abundant but of poor quality).

C. Forests and Forest Products.

D. Fresh and Salt Water Fisheries : sturgeon, mackerel, salmon, flounder, halibut, shad, herring, oysters.

E. Manufacturing : cotton goods, silks, woollens, iron and steel products, matches, toys, pottery, glassware, lacquer-ware, paper, camphor, art objects, ink, machinery, chemicals.

III. CHIEF CITIES.

Tokyo (capital) (7 289) ; Osaka (6 6) ; Kobe (4 340) ; Kyoto (4 426) , Nagoya (4 340) ; Yokohama (7 514).

IV. FORMER POSSESSIONS.

A. Korea (4-425). Annexed by Japan in 1910, taken from Japan by the Allies 1945. It was intended to make it an independent republic, but the part north of the 38th parallel was made a Communist state by the Russian occupying forces, the part south of the 38th parallel was made a democratic republic by the U.S. occupying forces. When the north invaded the south in 1950, the U.N. went to the help of the south. The country was still divided when a truce was signed in 1953.

a. Products : rice, barley, wheat, soya beans, tobacco, cotton ; tungsten, graphite, iron, manganese.

b. Chief Towns : Seoul ; Pyongyang ; Pusan.

B. Formosa (3-423). Seized by Japan, 1895 ; taken from Japan by Allies, 1945. (See Outline on China, page 104.)

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- C. South Sakhalin.** Ceded by Russia, 1905; restored to Russia, 1945.
D. Other Former Possessions : Kurile Islands, taken by Russia in 1945; Ryukyu Islands, Bonin Islands, occupied by the U.S.A., 1945

(Oshima group returned to Japan, 1953); former Japanese-mandated Mariana, Pelew, Caroline, Marshall Islands (American trusteeship, 1947); Kwantung (territory in Manchuria), restored to China, 1945.

China

CHINA (2 361 : map, 2 364) has an area of over 3,000,000 square miles, almost exactly the same as the land and inland water area of the United States, and a population half as large again as that of all the Americas. Isolated from the rest of the world by ocean, mountains, and desert, the Chinese reached a high degree of civilization when the peoples of Europe were still barbarians. Following the revolution of 1911-12, China became a republic. Civil war and unrest continued before and after the Japanese invasion of 1937-45 until in 1949 the Communist leader Mao-tse Tung gained control of the whole mainland, and set about re-organizing the country.

I. DIVISIONS OF GREAT CHINA.

China proper occupies the south-eastern corner of the country. The other main divisions are Mongolia (5 236) in the north, Sinkiang (7 331), including Chinese Turkestan, in the west, and Tibet (7 272) in the south-west. Manchuria (5-112) and part of what is now Mongolia was the Japanese puppet state of Manchukuo from 1932 to 1945.

II. PHYSIOGRAPHY.

- A. Plains of China and Manchuria.** Rich "loess" soil.
B. Mountains and Plateaux.
a. Kungun Mountains of Manchuria and Mongolia.
b. Altai Mountains and the plateau of the Gobi Desert.
c. Tian Shan and Kwenlun Mountains enclosing the plateau of Chinese Turkestan.
d. Plateau of Tibet bordered on the south by the Himalayas.
C. Rivers : Yangtze, Hwang, Amur, Si-kiang.
D. Island of Hainan (*f.i.*).

III. RESOURCES AND PRODUCTS.

- A. Agriculture :** rice, wheat, barley, maize, millet, sugar, indigo, tobacco, soya beans, tea, ginseng, bamboo, cotton.
B. Livestock : pigs, cattle, buffaloes, sheep.
C. Fisheries.
D. Minerals and Mining : coal, iron, petroleum, copper, tin, antimony, gold, silver, lead, bismuth.

E. Silk Industry and pearl fishing.

- F. Manufacturing :** textiles, pottery and porcelain; rugs, lacquer-ware, paper, pig bristles.
G. Transport : there are few railways in China, but the network of rivers and canals, including the Grand Canal, is very important to commerce.

IV. CHIEF TOWNS.

- A. China Proper.** Peking (capital) (6-107), Shanghai (7-15); Canton (2 214); Tientsin (7 275); Nanking (5 315); Foochow (*f.i.*); Hankow (4 126); Hangchow (4 126).
B. Manchuria (5-112). Changchun (capital); Mukden; Harbin; Dairen; Port Arthur.
C. Inner Mongolia (5-236). Hulehot, formerly Kweisui (capital); Ulan Hoto (former capital).
D. Sinkiang (including Chinese Turkestan) (7-331). Tihwa or Urumchi (capital); Yarkand; Khotan; Kashgar.
E. Tibet (7 272). Lhasa (capital) (7-272).

V. POSSESSIONS OF FOREIGN COUNTRIES.

- A. Hong Kong** (British) (4 191). Chief City, Victoria (commonly called Hong Kong).
B. Macao (Portuguese) (6-268).

VI. FORMOSA (Taiwan).

The island of Formosa (3 423), off the Chinese coast, a Japanese possession from 1895 to 1945, became the refuge of the Chinese Nationalist Government in 1949.

- A. Products :** rice, tea, sugar, sweet potatoes, jute, camphor; coal; fish, livestock.
B. Capital : Taipei.

Indo-China and Malay Peninsula

THE territory of South-East Asia between India and China is divided into Indo-China (4-256; map, 4-257) in the east; the Kingdom of Siam (7 45) in the centre, extending down to the Federation of Malaya (5 93); and a narrow strip of Burma in the west.

I. PHYSIOGRAPHY.

Northern highlands spread like a fork down the east and west coasts, enclosing central lowlands and narrow coastal plains.

II. PRODUCTS AND RESOURCES.

- A. Agriculture :** rice, rubber, maize, tobacco,

tropical fruits, sago, sugar-cane, tapioca, spices, tea, coffee, cotton.

- B. Forests :** ebony, rosewood, teak, ironwood, rattan.

- C. Minerals and mining :** tin, coal, tungsten, gold, lead, iron, copper, zinc.

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III. POLITICAL DIVISIONS.

- A. Viet-Nam Republic** (consisting of former Tonking, Annam, and Cochinchina) (7 399); **Cambodia** (2-179); **Laos** (4-445); (three states within the French Union). (Chief towns: Hanoi; Hué; Saigon, Pnom Penh; Vientiane).
- B. Siam**, 7 45 (independent kingdom). Capital: Bangkok (1 361).
- C. Federation of Malaya** (5-93, map, 5-94) (British). Capital: Kuala Lumpur.
- D. Singapore Colony** (5-94; 7 57) (British). Capital: Singapore (7-56) city.

India and Pakistan

THE sub-continent of India is the home of a population almost as large as that of China, and of a civilization more ancient than that of Europe. It consists of four distinct geographical areas: the Himalayan mountain and hill regions in the north; the river plains of the Indus, Ganges, and Lower Brahmaputra; the Deccan plateau; and the southern hills called the Eastern and Western Ghats. In 1947 British India was divided into India (4 239; map, 4 238) and Pakistan (6 39), the numerous semi-independent princely states joining one or the other during 1947 to 1950.

I. PHYSIOGRAPHY.

- A. Mountains and Plateaux:**
- Himalaya Mountains (4-176) and Hindu Kush on northern border.
 - Baluchistan (1 358) highlands in the extreme west.
 - Deccan (4 240) tableland in the south, surrounded by the Vindhya Hills and the Eastern and Western Ghats (*f.i.*).
- B. Plains of Hindustan** between northern mountains and Deccan.
- C. Rivers:** Indus (4 259); Ganges (3 501); Brahmaputra (1 268).

II. CLIMATE.

- Tropical in southern half.
- Dry, with cold winters, in north.
- Moist and cool in Himalayan region.
- Immense importance of monsoon (5 248) rains (S.W. in June, N.E. in Madras area in autumn).

III. RESOURCES AND PRODUCTS.

- A. India.**
- Agriculture:** tea, rice, wheat, groundnuts, oil-seeds, cotton, coffee, rubber, sugar.
 - Livestock:** cattle, buffaloes, sheep, goats, poultry.
 - Forests:** teak, sandalwood, and other timber.
 - Minerals:** coal, manganese, petroleum, salt, iron, mica, graphite, gold, diamonds.
 - Manufactures:** cotton cloth, silks, shawls, carpets, wood and metal goods, glassware.
- B. Pakistan.**
- Agriculture:** rice, wheat, barley, maize, cotton, jute, tea, sugar.
 - Livestock:** cattle, sheep, camels, buffaloes.
 - Minerals:** coal, chromite, gypsum, limestone, petroleum.

At partition, nearly all the established factories in the sub-continent fell to India. The manufacture of cotton-cloth, paper, jute, glass, woollens, etc., is being slowly developed in Pakistan.

IV. MAIN DIVISIONS AND CHIEF CITIES.

- A. India** (independent republic within the British Commonwealth) is a Union of the following States:
- Andhra** (*f.i.*). Provisional capital: Kurnool.
 - Assam** (1 276). Capital: Shillong.
 - Bihar** (1 444). Capital: Patna.
 - Bombay** (1 514). Capital: Bombay city.
 - Madhya Union**, or **Madhya Pradesh** (*f.i.*). Seat of government: Nagpur.
 - Madras** (5 69). Capital: Madras city.
 - Orissa** (*f.i.*). Capital: Cuttack (pending construction of a new capital at Bhubaneswar).
 - Punjab** (6-310). Capital: Simla (pending construction of a new capital at Chandigarh).
 - Uttar Union**, or **Uttar Pradesh** (7 372). Capital: Lucknow; other big cities: Cawnpore, Agra, Benares, Allahabad, Aligarh.
 - West Bengal** (1 428). Capital: Calcutta.
 - Hyderabad**. Capital: Hyderabad city.
 - Madhya Bharat**. Capital: Gwalior.
 - Mysore**. Capital: Mysore city; seat of administration: Bangalore.
 - Patiala and East Punjab States Union**. Capital: Patiala.
 - Rajasthan**. Capital: Jaipur.
 - Saurashtra**. Seat of administration: Rajkot.
 - Travancore-Cochin**. Capital: Trivandrum.
 - Ten centrally administered states:** Ajmer; Bhopal; Bilaspur; Coorg; Delhi; Himachal Union, or **Himachal Pradesh**; Kutch; Manipur; Tripura; Vindhya Union, or **Vindhya Pradesh**.

The Andaman and Nicobar Islands are centrally administered; the Laccadive Islands are attached to Madras State.

The Capital of the Republic of India is Delhi (3 66) city, chief part of Delhi State.

B. Pakistan (Dominion of the British Commonwealth) has five provinces:

- Punjab** (6 310). Capital: Lahore.
 - Sind** (*f.i.*). Capital: Hyderabad.
 - North-West Frontier Province** (6-41; 4-239). Capital: Peshawar.
 - East Bengal** (1-428). Capital: Dacca.
 - Baluchistan** (1-358). Chief town: Quetta.
- The capital of Pakistan, Karachi (4-393), is detached from the surrounding state of Sind and separately administered.

GEOGRAPHY

Note : Pakistan is composed of two widely separated parts, one in the N.E. of the sub-continent (the eastern part of Bengal), the other in the N.W.

The state of Jammu and Kashmir (4-398) was the subject of dispute between India (which claimed it because its Hindu ruler chose accession to India) and Pakistan (which claimed it because the majority of its inhabitants are Muslims).

V. NEIGHBOURING STATES AND FOREIGN POSSESSIONS

A. Three semi-independent states, between Tibet and the Republic of India : Nepal (5-386) (capital, Khatmandu), Sikkim (capital, Gangtok), Bhutan (capital, Bumthang).

B. Portuguese India : Goa, Daman, Diu (small settlements held by Portugal against claims by Republic of India).

Burma

THE Union of Burma (2-130), which lies between Tibet and China to the north, India to the north-west, Bay of Bengal on the west, and China, Indo-China, and Siam on the east and north-east, came into being in 1948. It was formerly British

I. PHYSIOGRAPHY.

A. Mountains : Parallel ranges running generally north and south form the western hills, central belt, and Shan plateau.

B. Rivers : Irawadi, Sittang, Salween.

II. RESOURCES AND PRODUCTS.

A. Agriculture in the fertile valleys : chief

crop, rice, also sesamum, groundnuts, cotton, maize.

B. Forests on the mountains yield teak.

C. Minerals : silver, lead, tungsten, petroleum, rubies, sapphires, jade.

III. CHIEF TOWNS.

Rangoon (capital) (6-363); Bassein; Pegu
Promo; Bhamo; Moulmein.

Ceylon

THE island of Ceylon (2-297), off the southern tip of the Indian sub-continent, was possessed in turn by the Portuguese, the Dutch, and the British. A British colony from 1802, it became a dominion of the British Commonwealth in 1948

I. PHYSIOGRAPHY.

A. Plateau and mountains : in south central portion (Adam's Peak).

B. Plain : in north and north central area.

C. Rivers : short, unnavigable, some drying up in summer.

II. RESOURCES AND PRODUCTS.

A. Agriculture : chief crops tea, rubber, rice, copra, vegetable oil, cacao, cinnamon.

B. Minerals : plumbago, graphite, gem stones

C. Pearl fishing.

III. CHIEF TOWNS.

Colombo (capital) (2-459); Kandy; Trincomalee.

Persia (Iran) and Afghanistan

PERSIA (6-129) and **Afghanistan** (1-46; map, 1-46) occupy the rugged mountains and arid tablelands that divide the Near East from Central Asia and the Far East. They are among the least developed of the Asiatic states, having few railways or industries.

I. PERSIA (IRAN).

A. Physiography. The Elburz Mountains in the north, and the vast stretches of the Iranian plateau in the centre and south, are the chief physical features. The Caspian Sea (2-256) forms part of the northern boundary, while, in the south, Persia extends along the Persian Gulf and the Gulf of Oman.

B. Resources and Products.

a. Agriculture and Livestock : wheat, barley, rice, fruits, sugar, cotton, sheep, camels, cattle, goats.

b. Minerals : petroleum, iron, coal, copper, lead, manganese, borax, nickel.

c. Manufactures : silk, cotton, and woollen materials, carpets, opium, gums, leather.

C. Chief Towns : Teheran (capital) (f.-1); Tabriz (f.-1); Isfahan.

II. AFGHANISTAN.

A. Physiography. The north-eastern half of Afghanistan is covered by the ridges and spurs of the Hindu Kush Mountains; the south-western half is a continuation of the Iranian plateau, extending over from Persia.

B. Resources and Products.

a. Agriculture and Livestock : wheat, barley, millet, maize, fruits, tobacco, sheep.

b. Minerals : copper, lead, iron, coal, silver, lapis lazuli.

c. Manufactures : felt, carpets, leather, karakul fur (lambskins).

C. Chief towns : Kabul (capital) (1-46 illus.); Kandahar (f.-1); Herat (f.-1).

Countries of South-Western Asia

BEFORE the First World War this area was part of the Turkish Empire; geographically it may be divided into four large natural regions, as described in the notes below.

I. ASIATIC TURKEY OR ANATOLIA.

A. Physiography. The plateau of Asia Minor (1-274) constitutes Asiatic Turkey (7 332; *map* 7-333); it is surrounded on all sides by mountains extending to the shores of the Black Sea and the Mediterranean, the most important being the Taurus Mountains in the south and south-east. (For Turkey in Europe, *see* page 97.)

B. Resources and Products.

a. **Agriculture and Livestock**: wheat, oats, barley, tobacco, cotton, opium, grapes, olives, figs; sheep, cattle, goats, asses, horses.

b. **Minerals**: chrome ore, copper, coal, zinc, lead, antimony, manganese, borax, salt, gold, silver, corundum.

c. **Forests and forest products**: timber, gums, wild fruit.

d. **Manufactures**: cotton goods, woollens, silk, rugs, leather, opium, olive oil.

C. Chief Towns: Ankara (capital of Turkey) (1 156); Ismir (Smyrna) (7 73); Bursa; Trabzon (Trebizond).

II. SYRIA (7 217), LEBANON (4 472), ISRAEL (4 302), JORDAN (4 382).

A. Physiography. Low mountains rise from the Mediterranean coast, except in the extreme south, where there is a strip of coastal plain. Beyond these mountains lie narrow river valleys parallel to the coast. Beyond these again lies the great Arabian Desert.

B. Resources and Products.

a. **Agriculture and Livestock**: wheat, maize, barley, millet, fruits, tobacco, cotton, hemp, olives; sheep, goats, cattle, camels, asses, horses.

b. **Minerals**: potash, bromine, phosphates, building stone, basalt.

c. **Manufacturing**: silk and cotton goods, olive oil, petroleum refining.

C. Chief Towns:

a. **Syria**: Damascus (capital) (3 34); Aleppo (*f.v.*); Homs (7 217).

b. **Lebanon**: Beirut (capital) (4-472).

c. **Israel**: Jerusalem (4-361); Tel Aviv-Jaffa (*f.v.*).

d. **Jordan**: Amman (capital) (4 382, 383 *illus.*).

III. IRAQ (4-278; *map*, 4 280).

A. Physiography. Iraq consists of a lowland plain formed by the valleys of the Tigris (7-277) and the Euphrates (3 306). It is for the most part treeless, and, except along the rivers, is an unproductive desert. However, with irrigation the soil becomes exceedingly fertile.

B. Resources and Products: wheat, barley, wool, cotton, dates, petroleum.

C. Chief Towns: Baghdad (capital) (1 346); Basra (4-278); Mosul (4 278).

IV. ARABIA.

The land of Arabia (1 190; *map*, 1 191) is divided into a group of independent and semi-independent states, the most important being the Kingdom of Saudi Arabia, which includes Nejd, Hejaz, and Asir; Yemen (1 191) along the Red Sea coast; Kuwait (1-191) at the head of the Persian Gulf; and Muscat and Oman (1-191), extending round the eastern tip of the Arabian peninsula from the Persian Gulf to the Indian Ocean. The British Colony of Aden (1 18) occupies the other tip of the peninsula at the mouth of the Red Sea. The Bahrein Islands (1 191) form a separate state, and there are seven other small sheikhdoms.

A. Physiography: Most of Arabia is a great desert tableland, bordered by narrow coastal plains and, in the south, by low mountain ranges.

B. Resources and Products: dates, livestock, hides, wool, coffee, petroleum, pearls.

C. Chief Towns: Mecca (5 156); Jeddah; Medina; Riyadh; Muscat; Hodeida; Aden (1-19 *illus.*).

Indonesia

THE term Indonesia covers geographically the Republic of Indonesia, New Guinea (Netherlands and Australian), and the Philippine Islands. This large group of islands lies between the south-east coast of Asia and the continent of Australia. Malay Archipelago is another geographical term for the same area.

I. PHYSIOGRAPHY AND CLIMATE.

A. Islands of Volcanic Origin: containing many active and extinct cones.

B. Typical Formation: Most of the islands have mountainous interiors, cut up by river valleys and surrounded by coastal plains.

C. Hot Equatorial Climate.

II. RESOURCES AND PRODUCTS.

A. Agriculture and Forest Products: rice, maize, tea, soya beans, spices, pepper, coffee, cane-

sugar, cacao, coconuts and copra, bananas, tobacco, manila hemp, indigo, quinine, rubber, gutta-percha, ebony, teak, sandalwood.

B. Minerals and mining: copper, iron, gold, tin, petroleum, coal, mercury, precious stones.

III. MAIN DIVISIONS.

A. Philippine Islands (independent republic) (6-156). Capital Manila (5-113).

B. Portuguese possession; part of Timor. Chief town Deli.

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C. British possessions.

a. Borneo (2-18).

1. British North Borneo. Capital: Jesselton.
2. Brunei. Capital: Brunei.
3. Sarawak (6 498). Chief towns: Kuching (capital); Sibn; Miri.

b. New Guinea (5-395).

1. Papua (Australian). Centre of administration: Port Moresby.
2. N.E. New Guinea and adjacent islands, administered by Australia under U.N. trusteeship.

D. Netherlands New Guinea—the western half of the island of New Guinea, all that remains to the Netherlands of its former East Indian Empire.

E. Republic of Indonesia (4-257; map, 4-258), the former Netherlands Indies apart from western New Guinea. Capital: Jakarta (more familiar as Batavia).

- a. Sumatra (7-187). Chief towns: Padang. Palembang; Medan.
- b. Java (4-355). Chief towns: Jakarta (capital of Indonesia); Bandung (Bandoeng). Jokjakarta; Surabaya.
- c. Madura (4-257).
- d. Kalimantan, part of Borneo (2-18). Chief towns: Pontianak; Banjarmasin; Balikpapan.
- e. Flores (2-286).
- f. Part of Timor (*f.-i.*). Chief town: Kupang.
- g. Celebes (2-286). Chief towns: Macassar; Manado.
- h. Molucca Islands (5-77; 4-257). Chief town: Amboyna.
- i. Bangka, Billiton. Riau Islands, Bali, Lombok.

AUSTRALASIA

AUSTRALIA (1 312; maps, 1-316, 319, f.p. 317) is the smallest of the continents. It was the last of the habitable portions of the globe to be explored and settled by white men. Occupying the same latitude as South Africa, it resembles South Africa in many important geographical features, chief of which is the division of the country into an arid western zone and rainy eastern zone. South-east of Australia lies New Zealand (5-422), the largest group of islands in the Pacific outside Indonesia. The remainder of the Pacific islands lie scattered over the vast watery stretches that separate Asia and Australia from the Americas.

I. AUSTRALIA (1 312)

A. Physiography.

- a. Western Australian plateau, including the desert region.
- b. Great central plains.
- c. East Australian highlands, including the Great Dividing Range.
- d. Murray and Darling rivers form the only important river system of Australia.
- e. Coastline smooth, very slightly indented. Great Barrier Reef.
- f. Tasmania (7-228).

B. Climate.

- a. Typical tropical climate in the north.
- b. Seasonal change in the south; high temperature of the interior.
- c. Rainfall: uncertain and insufficient in the interior and on the west coast; heavy on eastern coast.
- d. Temperate climate of Tasmania.

C. Vegetation and Animal Life.

- a. Typical Vegetation: eucalyptus (3 305); acacia (1-8); tree ferns, gigantic tulips and lilies, tall tropical grasses.
- b. Typical Animals: dingo (or wild dog); kangaroo (4-391); wombat; bandicoot; grey opossum; Tasmanian devil, Tasmanian wolf; duckbill (3-133); spiny ant-eater (1-170); frilled lizard (4-528 f.); laughing jackass; emu; (3-242); cassowary; black swan; lyre bird;

brush turkey; mallee-bird; bower birds (2 28). (The rabbit, though common, is not native.)

D. Natural Resources and Industries.

- a. Sheep and Cattle Raising the most important industries.
- b. Agriculture: wheat, oats, barley, maize, hay, sugar-cane, grapes, and other fruit.
- c. Minerals and mining: coal, gold, silver, lead, copper, tin, zinc, iron, tungsten, uranium.
- d. Manufactures: wool, leather, chemicals, metal products, lumber, wine.

E. Divisions of Australia.

- a. New South Wales (5 402). Capital: Sydney (7 216).
- b. Victoria (7 396). Capital: Melbourne (5-167).
- c. Queensland (6-322). Capital: Brisbane (2-71).
- d. South Australia (7-102). Capital: Adelaide (1-18).
- e. Western Australia (7-441). Capital: Perth (6-137).
- f. Tasmania (7 228). Capital: Hobart (4 183).
- g. Territories.

1. Federal Capital Territory, Canberra (2-209).
2. Northern Territory. Centre of administration: Darwin.

h. Possessions administered by the Australian Commonwealth: Territory of Papua; U.N. Trusteeship Territory of N. E. New Guinea.

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II. NEW ZEALAND.

New Zealand (5-422) consists of three main islands (the North Island and the South Island and a smaller one, Stewart Island, near the southern tip of the South Island). The group is situated about 1,300 miles south-east of Australia. Attached to New Zealand are several small islands and island groups, of which the most important are the Auckland Islands, Chatham Islands, Cook Islands, and Kermadec Islands.

A. Physiography and Climate.

a. The North Island consists of plains and plateaux marked by volcanic cones and hot springs.

b. Rugged cloud-capped peaks of Southern Alps on the South Island flanked by the Canterbury Plains.

c. Climate : semi-tropical conditions prevail in the north, while the south is temperate. Rainfall is abundant everywhere.

B. Resources and Products.

a. Agriculture and Livestock : wheat, oats, barley ; sheep, cattle, pigs, horses ; wool.

b. Forests and forest products : lumber and kauri gum.

c. Fisheries : whaling is an important industry.

d. Minerals and mining : coal, gold, silver, tungsten, copper, iron, silica sand, pumice, limestone.

e. Manufactures : meat packing, dairy and other food products, clothing, shoes, metal-ware.

C. Chief Towns : Wellington (capital) (7-487) ; Auckland (1 307) ; Christchurch ; Dunedin.

III. PACIFIC ISLANDS (6 25).

A. Resources and Products.

a. Wild and Cultivated Products : coconuts and copra, breadfruit, sugar, pineapples, bananas, taro, yams, sago, coffee, rubber, tea, rare woods.

b. Sea Products : pearl shell, turtle-shell, trepang or bêche-de-mer.

c. Minerals : phosphate, nickel.

B. Principal Islands of the Pacific.

a. Melanesia (6-26) . Bismarck or New Britain Archipelago, Solomon Islands, and Santa Cruz (British) ; Fiji Islands (British) ; New Hebrides (British and French) ; New Caledonia and Loyalty Islands (French).

b. Micronesia (6 26) : Marianas or Ladroneas, Pelew Islands, Caroline Islands, Marshall Islands (United States) ; Gilbert Islands (British).

c. Polynesia (6 26) : Hawaiian Islands (United States) ; Samoan Islands (United States and British) ; Ellice Islands, Tokelau Islands, Tonga or Friendly Islands, and Cook Islands (British) ; Society Islands, Tubuai or Austral Islands, Marquesas, and Tuamotu or Low Archipelago (French).

POLAR REGIONS

SURROUNDING each of the poles of the Earth is a region of extreme cold, where permanent settlement is difficult if not impossible. The North Polar or Arctic Region (1 220) consists for the most part of a great ocean into which are thrust the northern coasts of Europe, Asia, and North America. The South Polar Region or Antarctica (1 163) consists of a vast and lofty land mass cut off from other lands by hundreds of miles of open water.

I. ARCTIC REGIONS.

Physiography and Climate.

a. Arctic Ocean ; Bering Strait (1 88) ; Baffin Bay.

b. Chief Islands within Arctic Circle. Greenland (4 94), Spitsbergen, Fridtjof Nansen Land, Novaya Zembla, New Siberia, Lenin Land, Baffin Land, Banks Land, Victoria Land, Grant Land, Wrangel Island.

c. Arctic Plains or Tundras : in North America ; in Europe ; in Asia.

d. North Magnetic Pole (5 460 ; 5 83).

e. Climate. Extreme cold ; sunless winters ; midnight sun in summer.

Animals and Vegetation.

a. Sea Life : whale (7-445) ; dolphin (3 105), seal (6-525) ; walrus (7-417).

b. Land Mammals : arctic fox ; polar hare, white wolf ; polar bear ; ermine ; musk ox.

c. Reindeer, the domestic animal of the North (6 379).

d. Birds : auk (1-309) ; eider duck ; ptarmigan ; sandpiper ; snowy owl ; tern ; teal.

e. Vegetation : lichens (4-490) ; mosses (5-272).

C. Peoples of the Arctic Regions : Eskimos (3 296) ; Lapps (4 446).

D. Natural Resources and Industries : fur-bearing animals ; fishing ; whaling ; sealing ; walrus hunting ; coal.

E. North Polar Explorations (6 342).

II. ANTARCTIC REGIONS.

A. Physiography and Climate.

a. High Plateaux and Lofly Mountains. Average elevation as compared with other continents.

b. South Magnetic Pole.

c. Severe Antarctic Climate because of altitude of land mass.

B. Animals. 156.

a. Few Birds can bear the rigorous climate : penguin (6 115) ; petrel (6 146) ; albatross (1 92).

b. Sea Mammals : seal, sea-lion, sea-elephant (6 525) ; whales (7-445) ; dolphin (3 105).

c. Vegetation : mosses (5-272) ; lichens (4-490).

C. South Polar Explorations (6-344).

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NORTH AMERICA

THE Arctic Circle cuts across the American continent far to the north, and the Tropic of Cancer crosses central Mexico. This means that the great bulk of North America (5-452; *maps*, 5-452, f.p. 453) lies in the *temperate* zone, with a climate suited to the greatest variety of human enterprises. South America, on the other hand, has its largest area in the *tropical* zone. In contrasting the development of North and South America it is also important to note that South America was chiefly colonised by Spaniards and Portuguese, who did not regard the New World primarily as a land to be settled and developed, but as a treasure-house to be exploited for the benefit of their governments at home; whereas the English, Dutch, French, and later settlers of North America sought a permanent home in the New World.

I. GEOLOGICAL HISTORY.

- A. Growth of the Continent (5-454).
- B. Formation of Mountain Ranges and Plateaux.
 - a. The Laurentian Plateau—extending from northern Labrador to western tip of Lake Superior, and north to the northern plain.
 - b. The Appalachian Mountains (1-184)—from Gulf of St. Lawrence parallel with Atlantic Coast almost to Gulf of Mexico.
- C. Plains.
 - a. The Great Central Plain.
 - b. Northern Plain—between the Laurentian Plateau and Hudson Bay.
 - c. Coastal Plains: The Atlantic coastal plain; the Gulf coastal plain.

II. RIVERS AND LAKES EAST OF THE CONTINENTAL DIVIDE.

- A. The St. Lawrence System and the Great Lakes.
- B. The Rivers of the Atlantic Coastal Plain.
 - a. Chief rivers rising in the northern division

- of the Appalachians: St. John, Penobscot and Kennebec, Merrimac, Connecticut.
- b. The Hudson.
- c. Chief rivers rising in the southern division of the Appalachians: Delaware, Susquehanna, Potomac, Savannah.
- C. The Mississippi-Missouri System.
- D. The Rio Grande System.

III. RIVERS WEST OF THE CONTINENTAL DIVIDE.

- A. The Colorado System.
- B. The Columbia System.
- C. The Yukon System.

IV. RIVERS FLOWING INTO THE ARCTIC OCEAN AND HUDSON BAY.

- A. The Mackenzie-Athabaska System.
- B. The Nelson-Saskatchewan System.

United States of America

THE study of the natural resources of the country and of the multitude of uses to which they have been put are the most interesting and important points in the geography of the United States. From this point of view, the territory may be divided into several natural regions, each of which is particularly adapted to certain classes of industries and occupations. A comprehensive account of the natural resources and industries, as well as of the principal cities, will be found in the article on the United States (7-356). Each state in the Union is also the subject of a separate article.

NOTE: For exact boundaries of natural divisions of the U.S.A., consult *map* (7-f.p. 356).

I. NORTHERN DIVISION OF THE APPALACHIAN HIGHLANDS.

This region, which includes all New England, is essentially a manufacturing district. The surface of the land is generally broken and rocky; the only portions suitable for farming on an important scale are the narrow river valleys and lake bottoms. While poor in metals, the rock-ribbed hills of the interior yield building stone of great value. An inexhaustible source of power is found in the swift streams.

The principal centres of manufacturing and trade include Boston (2-21), Providence, Worcester, New Haven, Bridgeport, and Hartford.

II. THE ATLANTIC COASTAL PLAIN.

The southern ridges and plateaux of the Appalachian Highlands are separated from the sea by a strip of lowland called the Atlantic coastal plain, composed of layers of soil washed down from the ancient mountains. A natural boundary called the

"fall line" separates this region from that part of the Appalachian Highlands called the "Piedmont Plateau"; here the rivers, emerging from the western hills, plunge in falls or rapids to the plains below, at the same time putting an end to upstream navigation from the sea and providing a rich source of water-power. The Atlantic coastal plain is at once a manufacturing and an agricultural region. Its chief manufacturing and trade centres are grouped round the great natural harbours to the north; its agricultural districts become increasingly important towards the south.

Important towns include New York (5-410), Philadelphia (5-618), Baltimore (4-357), and Jersey City (f.-i.).

III. SOUTHERN DIVISION OF THE APPALACHIAN HIGHLANDS.

This is one of the busiest mining and industrial regions in the world. From the ancient seams of the mountains is mined a vast volume of coal that

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feeds the furnaces of thousands of factories. Drawing raw materials—iron ore chiefly—from the western districts, and provided with a convenient outlet for manufactured products to the east, this busy territory sets the pace for all other American industrial life.

Pennsylvania produces almost all the United States supply of anthracite, and has important deposits of other kinds of coal, as well as of petroleum and natural gas. The agricultural products of this region are almost as important as the minerals.

The region has many cities, chiefly mining and manufacturing centres, such as Pittsburgh (6-209) and Rochester.

IV. GULF COASTAL PLAIN.

This portion of the coastal plain, for the most part low and flat, is formed by the accumulated sediment of ages. An extremely fertile region, it includes the lower reaches of the vast Mississippi Valley. Most of the population is devoted to agriculture and there are comparatively few large towns.

Cotton is the chief agricultural product of the region, Texas being the leading cotton state, followed by Arkansas and Mississippi. Production and refining of petroleum, and of its subsidiary products, are the chief industries.

V. CENTRAL PLAINS AND INTERIOR HIGHLANDS.

This is the great farming region. The vast stretch of cultivable land which forms the upper Mississippi Valley, the lower Ohio Valley, and the Great Lakes Plain has a surface gently sloping southward and composed chiefly of fertile alluvial and glacial soils. Abundant rains and a warm summer climate favour successful agriculture. The region possesses extensive waterways, water-power, coal, petroleum, natural gas, and other mineral resources, which have helped to turn many of its sections into great industrial districts—among the richest and busiest in the nation.

Of the agricultural crops maize leads, followed by wheat. The Niagara Falls are in this region. Michigan leads the world in the production of motor cars, and Chicago (2-333) is the greatest meat-packing centre. The largest flour mills in the U.S.A. are at Minneapolis.

VI. GREAT PLAINS.

Between the central plains and the Rocky Mountains and stretching from Canada to Mexico lies a broad belt of almost treeless grassland called the Great Plains, for the most part flat or very gently undulating. Most of this semi-arid land is given over to stock-raising. But the wilderness is gradually being brought under cultivation, either with the aid of irrigation or through the special methods of "dry-farming." Coal in great quantities has been found, and petroleum fields have been discovered. There are few large towns.

VII. ROCKY MOUNTAINS.

Rising abruptly from the Great Plains, the Rocky Mountains form a lofty barrier that comes down from Canada and reaches seven-eighths of the way across the United States towards Mexico. These

mountains constitute the most important watershed in North America, giving rise to the four largest river systems in the United States—the Missouri-Mississippi, the Columbia, the Colorado, and the Rio Grande systems. Vast stores of mineral wealth have been brought to light in these rugged ranges. In the sheltered valleys agriculture and stock-raising flourish, while the swift mountain streams provide vast water-power harnessed for the service of man by the Hoover, Coolidge, and other great dams.

Beautiful scenery is preserved in the many National Parks. Towns include Denver, Cheyenne, and Laramie.

VIII. WESTERN PLATEAUX.

Between the Rocky Mountains and the Pacific Coast Ranges lies a long stretch of broken land, the greater part of which has less than 10 inches of rain a year. There are many real deserts in this region; the soil, however, is extraordinarily fertile, and in those districts where irrigation is possible or where the rainfall is somewhat above the average, fine crops can be grown. While consisting for the most part of high plateaux, this section contains also deep basins, one, Death Valley, being 280 feet below sea level.

The chief natural resources are minerals. Though the amount of agricultural land is relatively small, the yield per acre is high.

IX. PACIFIC RANGES AND LOWLANDS.

Nowhere in the world are the effect of mountains on climate and the effect of climate upon life better demonstrated than in crossing the lofty mountain ranges that separate the western plateaux from the Pacific slopes of the United States. To the east of these ranges is an arid parched region subject to violent changes of temperature, to the west a paradise with ample rainfall, equable temperature, luxuriant vegetation, flourishing fields, great cities, and thriving industries. The secret of this tremendous contrast lies in the fact that when the warm moisture-laden winds from the Pacific strike the mountain ranges they release their moisture among them in the form of rain or mountain snows.

This is the leading fruit producing region of the U.S.A., oranges, lemons, grapes, apples, and other fruits being grown in profusion. Food products and iron and steel products are among the principal manufactures. Near Los Angeles (5-38) is the famous film centre, Hollywood (2-176 illus.); Yosemite National Park (f.i.) contains magnificent wild scenery.

X. POSSESSIONS OF THE UNITED STATES.

- A. Alaska (1-88).
- B. In the Atlantic: Puerto Rico (6-301); U.S. Virgin Is.
- C. In the Pacific: Hawaiian Islands (4-139); Eastern Samoan Islands; Guam. The U.S.A. holds under U.N. trusteeship the Mariana, Pelew, Caroline, and Marshall Islands, and remains in occupation of the Ryukyu Islands (except the Oshima group) and the Bonin Islands, both formerly part of Japan proper.
- D. Panama Canal Zone (6-53).

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Canada

CANADA (2-195), a country of the British Commonwealth, has an area larger than the United States including Alaska, but is much less developed. The commercial centres on the Atlantic and Pacific coasts, and along the great interior waterways of Canada, present a picture of thriving industry, but in the north are vast stretches of wilderness still untamed. With tremendous natural resources in fertile soil, waterways, water-power, forests, minerals, and fisheries, Canada is every year taking a more and more important place in the world.

I. POLITICAL DIVISIONS.

(See map 2-f.p. 197).

- a. Maritime Provinces : Nova Scotia (5-469) ; Prince Edward Island (6-288) ; New Brunswick (5-393) ; Newfoundland (5-394).
- b. Eastern Provinces : Quebec (6-320) ; Ontario (5-512).
- c. Prairie Provinces : Manitoba (5-114) ; Saskatchewan (6-449) ; Alberta (1-593).
- d. Western Province : British Columbia (2-80).
- e. Territories : Yukon Territory (7-520) ; North-west Territories (5-461).

II. PHYSIOGRAPHY.

A. Mountains and Plateaux.

- a. Appalachian Highlands. Extending northward from U.S.A. into maritime provinces of Canada.
- b. Laurentian Plateau. Oldest land formation in North America. Covers more than half of Canada.
- c. Ranges of the Cordillera System in the West. The Canadian Rocky Mountains and the Coast Ranges enclose a great valley and plateau, which run parallel with the Pacific coast from the United States boundary to Alaska.

B. Plains.

Between Laurentian Plateau and Rocky Mountains, the Great Plains include southwestern Manitoba, central and southern Saskatchewan, all of Alberta except a southwestern strip, through the District of Mackenzie.

C. Rivers and Lakes.

- a. St. Lawrence River (6-486).
- b. Nelson-Saskatchewan system ; Red River (flowing into Lake Winnipeg.)
- c. Mackenzie-Athabaska system (5-64) ; Peace River.
- d. Yukon (7-520).
- e. Fraser (2-80).
- f. Great Lakes (4-68).
- g. Other large lakes : Lake Winnipeg ; Great Slave Lake, Great Bear Lake.

D. Coastline.

- a. Deep Fjords and Bays on Coasts of Labrador and British Columbia.
- b. Hudson Bay and Northern Island Groups.

E. Important Islands : Cape Breton Island ; Vancouver Island ; Newfoundland.

III. CLIMATE.

- A. Prevailing climate is of "Continental" type, with great variations in temperature.
- B. Influence of Great Lakes.
- C. The Atlantic maritime provinces have comparatively mild climate ; the harbours are free from winter ice, but fog prevails in Newfoundland.
- D. On the Pacific coast warm winds from the ocean keep the winters mild.
- E. Hudson Bay district is ice-bound for nine months of the year.
- F. Rainfall : heavy in west, slight in centre, moderate in east.

IV. NATURAL RESOURCES.

- A. Fertile Soil and good grazing land.
- B. Forests. About a third of Canada is covered by forests.
- C. Minerals.
 - a. Sudbury district of Ontario produces most of the world's nickel.
 - b. Most of the world's asbestos comes from Quebec.
 - c. Coal and petroleum.
 - d. Gold and silver.
 - e. Other minerals : Copper, iron, zinc, lead, cobalt, molybdenite, uranium, graphite.
- D. Fish.
- E. Fur-Bearing Animals.
- F. Waterways and Water-Power. The Great Lakes and the St. Lawrence River form one of the most important systems of water transport in the world.
- G. National Parks. There are some 30 national parks, the largest being Jasper (4,200 square miles).

V. INDUSTRIES.

- A. Agriculture. Wheat is the largest crop ; oats, barley, rye, flax, hay, potatoes, fruit ; irrigation and dry farming.
- B. Stock Raising, Dairying, and Dairy Products.
- C. Mining. Canada's vast mineral wealth is being developed.
- D. Lumber and lumber products. Wood pulp for making paper is an important product.
- E. Fisheries. The fish caught include cod, haddock, alewife, halibut, pollack, mackerel, herring, smelt, shad, sardine, flounder, trout, pike, whitefish, pickerel, and sturgeon. Oysters are found in the Gulf of St. Lawrence. Salmon canning in British Columbia. Importance of Newfoundland Banks (5-395).
- F. Fur Industry : this includes trapping wild animals and breeding on fur farms.
- G. Manufacturing. The most important manufacturing region in Canada is southern Ontario.

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VI. COMMUNICATIONS.

- A. Water Transport.** In addition to the natural waterways, numerous canals facilitate commerce in Canada. Chief among these are the Welland Canal (*f.i.*), the Trent Canal, the Rideau-Ottawa Canal system, the Rideau Canal.
- B. Railways.** The chief railways are the Canadian National and the Canadian Pacific.

VII. CHIEF TOWNS.

- A. Seaports :** Halifax (4-119); Saint John (6-

486); St. John's (*f.i.*); Vancouver (7-378); Victoria (7-397).

- B. River Ports :** Montreal (5 255); Quebec (6 321); Ottawa (capital) (6 9).

- C. Lake Ports :** Toronto (7 291), Kingston (*f.i.*); Hamilton (5 513); Fort William.

- D. Inland Towns :** Winnipeg (7 461); Regina (2-195; 6 500); London, Ont. (5 512); Edmonton (3 165); Calgary (2 175).

CENTRAL AMERICA AND WEST INDIES

THE continents of North and South America may be said to be connected by two sets of mountain chains. One of these forms the isthmus called Central America (2 291; *map*, 2-292). The other is partially submerged, leaving only its loftiest peaks and plateaux exposed. These form the chain of islands called the West Indies or Antilles, the Yucatan Peninsula, and the Florida Peninsula. All of Central America and all of the West Indies, except a few small islands to the north, lie in the Tropical Zone.

Central America

I. BOUNDARIES AND AREA.

- A.** Geographically, Central America is usually considered a part of North America, although its climate, its plant and animal life, and its people have more in common with tropical South America.
- B.** The total area of Central America is 220,440 sq. m. about four times that of England.

II. PHYSIOGRAPHY AND CLIMATE.

- A. Backbone of Mountains belonging to Cordillera Chain,** broken by Nicaragua basin.
- B. Atlantic or Caribbean Coastal Region.** Generally low and swampy, hot, and unhealthy.

III. PRODUCTS.

- A. Hot Lowland Region.** Bananas, mahogany, dyewoods, logwood, chicle gum, coconuts, rice, sesame seed, essential oils.
- B. Upland Region.** Coffee, tobacco, cacao, maize, beans, sugar, henequen; gold, silver, lead.

IV. POLITICAL DIVISIONS.

- A. Guatemala (4 101).** Chief towns: Guatemala City (capital); Atlantic coast port, Puerto Barrios; Pacific coast port, San José; Quirigua.
- B. Honduras (4 190).** Chief towns: Tegucigalpa (capital); Atlantic coast port, La Ceiba; Pacific coast port, Amapala.
- C. Salvador (6 492).** Chief towns: San Salvador (capital); Santa Ana; no Atlantic coastline; Pacific coast ports, Acajutla and La Unión.
- D. Nicaragua (5 430).** Chief towns: Managua (capital); Matagalpa, Leon; Atlantic coast port, Bluefields; Pacific coast ports, Corinto and San Juan del Sur.
- E. Costa Rica (2 514).** Chief towns: San José (capital); Cartago; Atlantic coast port, Limón; Pacific coast port, Puntarenas.
- F. Panama (6 52).** Chief towns: Panama (capital and Pacific coast port); Atlantic coast port, Colón.
- G. British Honduras (4 189).** Capital: Belize.
- H. Panama Canal Zone (United States) (6 53).**

West Indies

I. POSITION AND AREA.

The West Indies (7 442; *map*, 7-442) stretch from the entrance to the Gulf of Mexico eastward and southward to the coast of South America, forming the northern and eastern boundary of the Caribbean Sea. With the exception of a part of the Bahamas, they lie entirely within the tropical zone. The Bahamas reach within 60 miles of the coast of Florida.

II. PHYSIOGRAPHY AND CLIMATE.

- A.** Bahamas consist of coral formations resting on submerged mountains.
- B.** Remainder of West Indies chiefly of volcanic formation. Most of the islands have important mountains, sometimes snow-capped. Mont Pelée is an active volcano.

- C.** Rolling plains on some islands and low swampy coast lands.
- D.** Usually hot and damp with abundant rainfall.
- E.** Hurricanes are frequent.

III. PRODUCTS.

- A.** Cane-sugar, tobacco, fruits, cotton, coffee.
- B. Rare Woods :** mahogany, lignum vitae, ebony, rosewood, logwood, satinwood.
- C. Livestock.**

IV. DIVISIONS OF WEST INDIES.

(1) The Bahamas; (2) the Greater Antilles, including Cuba, Jamaica, Haiti, and Puerto Rico; and (3) the Lesser Antilles, including the Leeward Islands, the Windward Islands, Barbados, Trinidad and Tobago, and the chain of small islands

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off the north coast of South America, the most important of which form the Curaçao group.

- A. Bahamas (1-347)** (British). Comprise more than 3,000 islands and islets. Capital: Nassau. The Turks and Caicos Islands belong geographically to the Bahamas, but are under the government of Jamaica.
- B. Cuba (3-6)** (Republic). Chief towns: Havana (capital); Camaguey, Cienfuegos; Santiago de Cuba; Guantanamo; Santa Clara; Marianas; Holguin.
- C. Jamaica (4 337)** (British). Capital: Kingston.
- D. Haiti.** This island is divided politically into two parts:
 - a. Republic of Haiti (4-118). Capital: Port-au-Prince.
 - b. Dominican Republic (3-106). Capital: Ciudad Trujillo. Both republic and capital were formerly called Santo Domingo.
- E. Puerto Rico (6 301)** (United States). Capital: San Juan.
- F. British Leeward Islands.** Principal islands: British Virgin Islands, comprising Tortola, Virgin Gorda, Anegada, Jost Van Dyke, and about 30 smaller islands; St. Kitts, Nevis, and Anguilla; Antigua, Barbuda, and Redonda;

Montserrat. Chief town: St. John, on Antigua Island.

- G. French Leeward Islands.** Principal islands: Guadeloupe and Marie Galante. Chief towns: Basse-Terre (capital) and Pointe-à-Pitre. Under the Guadeloupe government is included one-half of the island of St. Martin, the other half belonging to the Netherlands.
- H. Leeward Islands (United States).** Consisting of part of Virgin Islands. Principal islands: St. Croix, St. Thomas, and St. John. Chief town: Charlotte Amalie.
- I. Windward Islands:**
 - a. Martinique (5-138) (French). Capital: Fort de France.
 - b. British Windward Islands. Principal islands: St. Lucia, St. Vincent, Grenada, Dominica. Chief towns: St. George, Castries, and Kingstown.
- J. Barbados (1 366)** (British). Capital: Bridgetown.
- K. Trinidad and Tobago (7 317)** (British). Chief towns: Port of Spain (capital) and Scarborough.
- L. Netherlands Antilles.** Curaçao, Bonaire, Aruba, St. Eustatius, half of St. Martin (St. Maarten). Capital: Willemstad.

SOUTH AMERICA

SOUTH AMERICA (7-96; maps, 7-96, f.p. 97) is endowed with vast natural resources, every variety of climate and land formation, rich mineral deposits, great rivers, vast forests, and fertile plains. It has several fine cities. Politically, government in the South American republics is unstable, they are prone to revolution and despotism.

I. PHYSIOGRAPHY.

- A. Mountains and Highlands.**
 - a. Andes (1 148), extending along the west coast from Isthmus of Panama to Cape Horn.
 - b. Brazilian highlands or tableland in the east.
 - c. Guiana highlands and plateau in the north.
- B. Plains.**
 - a. Amazon Lowland. Covered with a dense tropical forest.
 - b. Guiana Lowlands and Coastal Plain.
 - c. Temperate Zone Forests cover portions of south central plains such as the Gran Chaco.
 - d. Treeless Grasslands: llanos of Colombia and Venezuela, grasslands of Southern Brazil, Paraguay, and Uruguay, pampas of Argentina; savannas of Guiana.
- C. Rivers and Lakes of South America.** All the important rivers of South America empty into the Atlantic Ocean.
 - a. Magdalena in the extreme north (2-457).
 - b. Orinoco (6-3).
 - c. Amazon, with more than 200 tributaries. (1-129).
 - d. Tocantins and São Francisco rivers (2-49).
 - e. Plata river (1-224, 225), formed by the junction of the Uruguay and the Paraná.
 - f. Rio Negro forming the northern boundary of Patagonia.
 - g. Lake Titicaca, largest lake in South America (1-507, 508 illus.).
- D. Chief Islands near South America:**
 - a. Tierra del Fuego group (2-357).
 - b. Trinidad (7 317).

- c. Falkland Islands (3 339).
- d. Juan Fernandez Island (3-2, 2-359).
- e. Galapagos Islands (3-498).

II. CLIMATE.

Intensely hot and damp in tropical lowlands and coastal plains; bitterly cold in heights of Andes; temperate in south.

A. Rainfall.

- a. Tropical lowlands east of Andes have heavy rainfall.
- b. Prevailing easterly winds in tropical north deposit their moisture on eastern slopes of Andes, leaving most of west coast arid.
- c. Prevailing westerly winds on Pacific side of Andes blow over cold Humboldt current before reaching coast, and so leave little rain on coastlands; drop snow on high mountains.
- d. Very heavy rainfall in the extreme south.

III. MINERAL RESOURCES.

- A. In Northern Andes.** Emeralds, platinum, gold, silver, iron, coal, salt.
- B. In Central Andes.** Silver, tin, nickel, copper, tungsten, lead, iron, zinc, vanadium, manganese, antimony, bismuth, sulphur, coal, gypsum, borax, nitrates.
- C. In Southern Andes.** Coal.
- D. In Guiana highlands.** Gold, bauxite, diamonds.
- E. In Brazilian highlands.** Diamonds, iron, and gold are most important; others are platinum, thorium, silver, copper, lead, mercury, manganese, coal, and graphite.
- F. North coast.** Petroleum.

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IV. VEGETATION AND ANIMAL LIFE.

A. Typical South American Plants :

a. **Native Plants :** quebracho ; brazil-wood ; rubber trees ; ivory palm ; araucarian pine ; cinchona (5-93) ; sarsaparilla ; indigo (5-256) ; tolu balsam ; fustic or dye wood ; bamboo (1-359) ; cacao (2-438) ; coca (6-139) ; maté (2-46 ; 4-187) ; orchids (5-529) ; giant water-lilies (7-428) ; cotton (2-516) ; potato (6-273) ; manioc (7-226 ; 6-76) ; tomato (7-290) ; tobacco (7-286) ; pineapple (6-204).

b. **Chief Introduced Plants :** coffee ; sugar-cane ; oranges ; bananas.

B. Typical South American Animals : monkeys, (5-240) ; jaguar (4-336) ; puma (6-304) ; tapir (7-227) ; llama (4-530) ; alpaca (1-119) and vicuña (4-530) ; pudu or dwarf deer, pampas deer, and guanaco (3 60) ; peccary, chinchilla (2-377) ; sloth (7-68) ; armadillo (1 241) ; anteater (1-170) ; vampire bat (1-382) ; manatee or sea cow (*f.v.*) ; opossum (5 521) ; rheas (7-07) ; condor (2-479) ; toucan (7-301) ; hoatzin ; parrots (6-92) ; macaws (5-61 ; 6-92) ; white ibis ; flamingo (3 385) ; alligator (1-113) ; matamoras turtle ; iguana (4-235) ; teguexia (4-528) ; boa constrictor (7-74, 75 illus.) ; anaconda (2-45 illus. ; 7-75 illus.).

Countries of South America

A. Colombia (2-457 ; map, 2 457). Chief products : coffee, sugar, rice, maize, bananas, hides, platinum, gold, emeralds, silver, iron, salt, petroleum. Chief towns : Bogotá (capital), Medellín, Cali, Barranquilla, Cartagena.

B. Venezuela (7-384 ; map, 7-385). Chief products : petroleum, cotton, coffee, cocoa, rubber, sugar, hides, gold. Chief towns : Caracas (capital) ; Valencia ; Maracaibo ; Barquisimeto ; Maracay.

C. Brazil (2-45 ; map, 2-46). Chief product : Brazil produces two-thirds of world's coffee. Other products : manioc, sugar, hides and leather, maize, rice, cotton, meat, cocoa, tobacco, beans, oranges, bananas, rubber, timber, diamonds, gold, manganese, chrome ore, mica, coal, iron, salt. Chief towns : Rio de Janeiro (capital) (6-402) ; São Paulo ; São Salvador (Bahia) ; Recife (Pernambuco) ; Belem (Pará) ; Porto Alegre ; Manaus.

D. Ecuador (3-160). Chief products : cocoa, coffee, rice, balsa wood, kapok, vegetable ivory, gold. (Chief towns : Quito (capital) ; Guayaquil ; Cuenca.

E. Peru (6-138 ; map, 6-139). Chief products : sugar, cotton, rice, cocoa, coffee, wool, hides and skins ; quinine, coca and cocaine, copper, coal, lead, zinc, vanadium, petroleum. Chief towns : Lima (capital) (4-507) ; Arequipa ; Callao.

F. Bolivia (1-507). Chief products : tin, copper, lead, zinc, rubber, quinine, cattle and hides, cocoa, coffee. Chief towns : La Paz (seat of government) ; Cochabamba ; Sucre (the nominal capital).

G. Chile (2 357). Chief products : nitrates, copper, coal, manganese, silver, tungsten, molybdenum, sulphur, guano ; timber, wheat, hides and leather, meat, wool. Chief towns : Santiago (capital) (6 498) ; Valparaíso (7 375) ; Concepción ; Antofagasta ; Iquique.

H. Paraguay (6-76). Chief products : livestock, meat and hides, yerba maté, tobacco, sugar, quebracho and other timbers. Chief towns : Asunción (capital) (6-76, 77 illus.) ; Villarrica.

I. Argentina (1-223 ; map, 1 225). Chief products : meat, hides, wool, wheat, maize, linseed, oats, cotton, sugar, grapes, tobacco, yerba maté, vegetable oils ; textiles ; petroleum. Chief towns : Buenos Aires (capital) (2 108) ; Rosario ; Córdoba, La Plata ; Tucumán ; Santa Fé ; Mendoza ; Paraná.

J. Uruguay (7-370). Chief products : cattle, sheep, meat, wool, hides and skins, wheat, linseed, barley, rice, oats, grapes. Chief towns : Montevideo (capital) (5-251) ; Salto ; Paysandu.

K. Guiana (4-101 ; map, 4 101).

a. **British Guiana.** Chief products : sugar, coffee, balata, rum, timber, coconuts, rice, bauxite, diamonds, gold. Capital : Georgetown.

b. **Surinam (Netherlands Guiana).** Chief products : sugar, bananas, coffee, rice, maize, citrus fruits, molasses, balata, gold, bauxite. Capital : Paramaribo.

c. **French Guiana.** Chief products : gold, rice, maize, sugar, cocoa, manioc, bananas. Capital : Cayenne.

MEXICO

MEXICO (5-186 ; map, 5-186) is a land of enormous natural wealth, but its resources lie for the most part undeveloped. For its Spanish conquerors Mexico was simply a great mine of gold and silver, a storehouse of rare woods and spices, to be exploited for the benefit of the royal government in Spain, and its favoured representatives. The Indians of Mexico were virtually enslaved. The land won its independence in the early part of the nineteenth century ; but a hundred years of political chaos followed before Mexico began to take its due place in world affairs.

I. PHYSIOGRAPHY.

A. Mountains. These form part of the great Cordillera system, and are divided into two principal ranges : Sierra Madre Oriental or Eastern Sierra Madre, and Sierra Madre Occidental or Western

Sierra Madre. The central Mexican plateau lies between the two ranges.

B. Coastal Plains. The eastern coastal plain, an extension of the Gulf coastal plain of the United States, broadens out in the south to cover most

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of the Yucatan Peninsula (7-517). The coast is low and has no good natural harbours. The western coastal plain is narrow, but has many fine harbours.

C. Rivers. With the exception of the Rio Grande, the rivers of Mexico are of no great size.

II. CLIMATE.

Coastal plains exceedingly hot; central plateau mild; mountains cold. Yucatan and lower California generally hot and dry. Heavy rains in the south, but mountains cut off moisture from interior.

III. NATURAL RESOURCES AND INDUSTRIES.

A. Rich Soil and extensive grazing lands.

a. Chief Food Crops : maize, wheat, beans, sugar-cane, coffee, cacao, fruits, and spices.

b. Fibre Crops : cotton, agave or sisal plant.

c. Other Crops : tobacco, guayule rubber.

d. Stock Raising on the northern plateaux.

B. Minerals.

a. Anthracite coal in Sonora ; graphite.

b. Metals. Silver, gold, copper, lead, iron, antimony, quicksilver, zinc, manganese.

c. Vast supplies of petroleum.

C. Great Forests of valuable timber.

D. Manufacturing. Meat-packing, cotton-milling rope and twine, soap, cigars and cigarettes, sugar, rubber.

V. CHIEF TOWNS.

Mexico City (capital) (5-189) ; Guadalajara (5-186) ; Vera Cruz (7-390) ; Montorey ; Leon.

Interest-Questions in Geography

What does the name of the Himalaya Mountains mean ? 4-176.

How did a volcano preserve an ancient civilization ? 6-257.

What regulates the rainfall ? 6-300.

How is rainfall measured ? 6-301.

What is the most important agent in shaping land surfaces ? 7-429.

Why is the Sahara a desert ? 6-444.

What makes sand ? 6-105.

Where can you draw fresh water from the Atlantic Ocean ? 1-120.

What great continent lies uninhabited by Man ? 1-103.

In what city are there many floating homes ? 2-211.

Where is the oldest existing canal ? 2-205.

Why is the Hwang-Ho called " China's Sorrow " ? 4-212.

How does a mountain reveal its age ? 6-146.

How does it happen that some people living on the Equator suffer from cold ? 2-400.

Where are the Pillars of Hercules ? 4-20.

How did the Latin Quarter of Paris get its name ? 6-79.

Where is there a great wall of ice 500 miles long ? 1-104.

What makes a geyser spout ? 4-15.

What made Niagara Falls ? 5-428.

Why is a rain storm feared in Lima, Peru ? 4-507.

What queer lake helps to surface the roads ? 7-317.

What country is the holy land of three religions ? 6-45.

Why does the Dead Sea deserve its name ? 6-49 illus.

What country produces most of the world's platinum ? 6-221.

Where do birds catch fish for their masters ? 2-367 illus.

What tiny island was called the Gibraltar of the North Sea ? 4-150 illus.

Where does there still live a tribe of pygmies ? 6-312.

How does infertile Chile make the world fertile ? 2-358.

Why did Africa remain a dark continent so long ? 1-52.

What region leads the world in volcanoes ? 2-293.

How does manufacturing help to make fogs ? 3-405.

Why is the Red Sea red ? 6-375.

In what continent did the human race probably originate ? 5-203.

What causes earthquakes ? 3-152.

What single river basin is almost as large as the United States ? 1-130.

Which is the longest mountain system ? 1-148.

What country is supported by gambling ? 5-250.

What Canadian port is nearly 1,000 miles from the sea ? 5-255.

What country has more canals than railways ? 5-377.

What French port was benefited most by the opening of the Suez Canal ? 5-187.

What sea was the first to be navigated by white men ? 5-166.

What important French river flows through a natural tunnel for three miles ? 5-185.

Which is the smallest county in England ? 6-482.

What wild animals are still at large in Europe ? 3-312.

Which is Britain's highest mountain ? 1-130.

What places have the greatest and smallest variations in temperature ? 2-100.

Where are there famous hot springs ? 4-15.

Of what country is the old Kingdom of Bohemia part ? 3-21.

Which is Canada's chief winter port ? 6-146.

Where is the world's largest cave ? 2-276.

How did Florida get its name ? 3-303.

In what part of the British Isles is French the official language ? 2-302.

What is the largest city in South America ? 2-108.

Where are the most dangerous volcanoes in America ? 6-493.

Where are the world's chief gold-fields ? 4-39.

Which is Great Britain's longest river ? 3-247.

Which is the largest city in India ? 2-172.

How did Carolina get its name ? 2-244.

Which is Europe's " oldest state " ? 6-497.

Where is the heaviest rainfall ? 2-410, 4-240.

What is another name for Shropshire ? 7-44.

Which is the deepest ocean ? 6-25.

Where is the Atlantic west of the Pacific ? 6-54.

What is the Garden of the Gulf ? 6-288.

Which is the City of Steel or Iron City of the U.S.A. ? 6-200.

What is a hacienda ? 2-203.

What did Khufu build ? 6-312.

Where is the Gran Chaco ? 1-507.

Is Buda or Pest the older part of Budapest ? 2-106.

What was the Polish Corridor ? 6-241.

Where and what is the heating apparatus of N.W. Europe ? 4-105.

How long is the Khyber Pass ? 1-46.

Can you tell a Persian from a Turkish carpet ? 2-346.

What is the Heidelberg tun ? 4-157.

Where are the Fortunate Isles believed to be ? 2-208.

What are Rum, Elgg, and Muck ? 4-275.

Where is " la ville lumière " ? 6-79.

What is Hull's full name ? 4-202.

Where is the " city of peace " ? 4-361.

Which is the Keystone State of the U.S.A. ? 6-119.

What is " Peruvian bark " used for ? 6-141.

HISTORY

HISTORY (4-180) occupies a very important place in the field of knowledge, for an understanding of current world affairs social, political, and economic must be based on a knowledge of their historical background. History, as it is taught and written to-day, is no longer a narrative of isolated incidents, of wars and intrigue, or marriages and deaths of kings and queens, or of the detached deeds of famous men and women. Rather it is an account of the origin and development of human institutions and ideas. It deals with the conditions under which ordinary men and women lived in various ages and countries; it deals with their customs, arts, and ideals, with the growth of law and government, and with the influence of leaders upon the fate of peoples, and of popular discontents on the fate of rulers. Fuller and wider knowledge of history should, and may, help mankind to avoid repetition of some at least of his past mistakes. The History Charts (8 134) show what was happening in different countries at the same time.

ANCIENT HISTORY The Dawn of Civilization

I. PREHISTORIC PERIOD.

For thousands of years before the oldest kind of writing was invented, men and women and children had been working and playing in many parts of the world. Careful study of the things they left stone tools, pieces of pottery, pictures on cave walls has revealed a great deal about the way these people lived, and the almost unbelievably slow steps by which they learned the arts of civilization have been traced. But, because they lived before there was any *written* history, they are called prehistoric men.

A. Stone Age Man (7-161).

a. Eolithic Age (5 106, 7 162).

b. Old Stone or Palaeolithic Age (5 106; 7-162).

1. Cave Dwellers (2 282).

2. Remarkable artistic ability; drawings (5 78; 2 279 illus.; 5 104 seq.).

c. Mesolithic Age (7-163).

d. New Stone or Neolithic Age (7-163; 5 106).

1. Beginnings of settled life and division of labour.

2. Interesting remains. Lake Dwellers, (4-439).

B. Dawn of History with Bronze Age.

a. Discovery of Metals quickens march of progress (2 92; 5-109; 2-73).

b. Invention of Writing ends Prehistoric Age.

II. DEVELOPMENT OF CIVILIZATION ALONG THE NILE.

A. Favourable Situation of Northern Egypt (3-183).

The fertile strip of the Nile Valley, protected on all sides by deserts and the sea, was an ideal situation for the beginnings of civilization. The rich soil brought down by the Nile supported a dense population; the river itself was a great highway; the quarries of the neighbouring deserts furnished unlimited building materials.

B. Great Epochs of Egyptian History. The History Chart at the end of this Outline should be consulted.

a. Long period of Early Development culminating in the union of Upper and Lower Egypt.

b. Pyramid Age. The building of monumental Pyramid tombs to gratify the vanity of the Pharaohs became the dominant interest, exhausted the wealth, and took a terrific toll of the slave labour (3 193) of Egypt.

c. Feudal Period - when nobles ruled vast estates. During a long struggle between rival rulers and sections Egypt became so weak that it fell before the Hyksos, who were of Asiatic origin.

d. Defeat of the Hyksos Kings and Rise of the Empire.

1. Egyptian nobles rebelled against the Hyksos and drove them out (c. 1580 B.C.).

2. Great Temple of Karnak crowned revival of art (3 186 illus.).

e. Fall of the Empire. Pursuing the Hyksos Kings into Asia, the Egyptians began a period of foreign conquest, which for many centuries added to Egypt's glory, but which eventually led to the invasion and subjugation of Egypt, first by the Assyrians (671 B.C.) and later by the Persians (525 B.C.). With these invasions ended the period of distinctive Egyptian culture.

Note: The Egyptian rulers are often grouped into dynasties beginning with the half-legendary Menes (c. 3200 B.C.). The IVth Dynasty marked the height of the Pyramid Age; the XVIIIth began and the XXXIst ended the Imperial Period.

C. How the Ancient Egyptians Lived.

a. Religion (3-183).

1. Belief in a life after death shown by careful preservation of bodies (mummies: 5-295) and building of suitable tombs.

2. Gods and sacred animals (2 263; 3-199; 4 301; 6-6).

3. Priesthood.

b. Industrial Life. Agriculture (1 71); boats and ships (7-28; 3-204); tanning (4-466); glassmaking (4-30); fishing (3-378); furniture (3-490); papyrus (6 62).

c. Art and Science. Architecture (1-209); astronomy (1-278); writing (1-120 illus.); painting (3-194, 195, 199 illus.; 6-33); sculpture (6-520; 2-89 illus.; 3-184 et seq.).

HISTORY

III. EARLY CIVILIZATIONS OF WESTERN ASIA.

That part of Asia to-day called the Near East (sometimes the Middle East), and consisting of Asia Minor, Syria, and the Arabian Peninsula, was the ancient home of civilizations that had a profound influence upon subsequent culture and history. These civilizations grew up in what has been called the Fertile Crescent, consisting of that borderland between the mountains on the north and the Arabian desert where crops could be grown and cities built.

A. Mesopotamia (5 175) or Iraq—the eastern part of the Fertile Crescent (*map*, 3-183).

a. Sumerian Culture. The Sumerians (a non-Semitic people), in their group of city states along the rivers Tigris and Euphrates, originated the characteristic culture of Mesopotamia which was to endure through centuries of conquest. Cuneiform writing (1-336; 1-119 illus; 5-176; 6-129).

b. Babylonian Empire (1 336). Established by Semitic tribes who conquered Sumerian cities. The conquerors absorbed and modified the Sumerian culture, developing a highly organized social and political system. Brick-making (2-57); writing (1 336); painting (6-33); music making (5-302); creation story and Genesis (1-15).

c. Assyria absorbs Babylonia in Great Assyrian Empire (1-335; 5-176).

1. Improvements in art of warfare make possible the conquest of a vast military empire; introduction of iron weapons increases fighting efficiency.

2. Hittites (3-200) and Israelites (4-374) conquered.

3. Nineveh, the capital built by Sennacherib (5-440).

4. Artistic advance especially marked by sculptures depicting the conquests; use of stone in building; painting; engraving; library at Nineveh (2-2).

Note : It is important to keep in mind that slavery was an essential part of all ancient civilizations; the people of conquered cities and tribes were made captive, and formed the slave class without which the great buildings of the time could not have been constructed.

d. Chaldean Empire (1-338).

1. Babylon rebuilt; the hanging gardens, one of the "seven wonders" of the ancient world (7-1, 1-illus. f.p. 336); Nebuchadnezzar's canal (2-205).

2. Babylonian captivity of the Jews, which advanced Hebrew culture (1-339).

B. Syria—the western end of the Fertile Crescent.

a. Phoenicians (6-160)—the early traders who carried the alphabet to all civilized lands. Although they had built their cities on the "battleground of empires," these peaceful merchants suffered little from the successive conquests, for they were content to pay tribute to any conqueror as long as they were allowed to continue their trading enterprises.

b. Hebrews (4-373) a people who retained an intense tribal and religious unity despite conquests and oppression.

1. Nomadic wanderings begun by Abraham (1-5); terminated by Moses (5-270).

2. Kingdom established under David (3-53) and his son Solomon (7-83); capital is Jerusalem (4-361).

c. Philistines (6-157). This tribe of ancient Canaan was long the enemy of the Israelites (4-374).

C. Asia Minor.

a. Hittites (3-200). Through their wars with the Hittites the Assyrians and Egyptians learned the use of iron for tools and weapons, and the value of the horse.

b. Lydians. These people of Asia Minor rose to such prosperity that the name of their king, Croesus (2-533), is still the symbol for fabulous wealth; earliest known use of coins.

D. Indo-European supremacy supplants Semitic power. The Indo-European peoples moving southward from the mountains north of the Fertile Crescent were of the same blood as the peoples of modern Europe.

a. The Medes (5-159).

b. The short-lived Persian Empire (6-129).

1. Religion of Zoroaster, the first universal religion (7-527).

2. Rising power of Greece stays westward tide of Persian conquest (4-73; 6-129).

3. Alexander's conquest ends great Asiatic Empires (1-98).

The Greeks

I. THE RISE OF EUROPEAN CIVILIZATION.

Aegean Civilization (1-22). This civilization developed in Crete and spread over the Aegean world.

a. Effect on European civilization (*map*, 1-22). The islands of the Aegean were the stepping-stones that brought civilization to Europe.

b. Discoveries of archaeologists. Excavations at Knossos and elsewhere (1-25, 23 illus. 24 illus.).

II. GREEK INVASION OF THE AEGEAN WORLD.

A. Nomad tribes from the North (1-24). The

Greeks came down from the unknown north and conquered the Aegeans; adopted much of the Aegean culture. The Greeks were a northern branch (Indo-European) of the same stock as the Medes and Persians (Indo-Iranians) who had invaded the Semitic world of western Asia.

B. Times described by Homer mark the high tide of the migration (4-71; 4-189).

a. Trojan War (7-320).

b. Culture of the Achaeans. An account of the culture of these early Greeks is preserved in the Iliad and the Odyssey of Homer.

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III. DEVELOPMENT OF GREEK CITY STATES.

A. Lack of unity among the Greeks. This is the keynote of Greek political history, and was due to geographical influences.

B. Evolution of Democracy (4-76; 3-70; 1-288).

a. Athens the intellectual leader of Greece (1-287). Reforms of Solon make government more democratic.

b. Sparta, the military state (7-123). Lycurgus, the great law-giver (7-124).

Note : It must be remembered in discussing Greek democracy that it was limited to an aristocratic class, the citizens of the states. In the Greek cities the greater part of the menial and skilled labour was done by slaves and free men who were not citizens.

IV. PERSIAN WARS.

A. Greece checks Persian invasion and saves Europe from Asiatic domination (4-73; 6-129).

a. Famous battles : Marathon (6 130); Salamis (*f.i.*); Thermopylae (7 268).

b. Leaders : Themistocles (*f.i.*); Aristides (1-227).

B. Results of the Wars. They led to the foundation of the Delian League (4-76), which became the Athenian empire.

V. AGE OF PERICLES (1-287; 6-125)—THE "GOLDEN AGE" OF GREECE.

A. "Plain living and high thinking" in ancient Athens.

B. Far-reaching effects of this period. It served to crystallise all the previous culture of Greece; it stimulated new and immortal achievements; and it established such high and firm standards in art, literature, and philosophy that Greece continued to be the intellectual leader of the world long after the political power of the Greek states was broken.

VI. CULTURE OF THE GREEKS.

A. Literature (4-92).

a. Poetry : Homeric epics (4-93); lyric poetry (4-93).

b. Drama : evolved from dialogues and choruses of religious festivals (4-93; 7-263).

1. Aeschylus (1-45); Sophocles (7-85); Euripides (3-307); Aristophanes (1-227).

2. Greek Theatres (7-263).

c. Prose : developed by historians and orators (4-94).

1. Herodotus, the "father of history" (4-170).

2. Demosthenes, greatest of orators (3-70).

B. Art (4-89) and Architecture (5-532; 531 illus.).

a. Pheidias, the master sculptor and builder (6-153; 3-228; 4-89; 1-12).

b. Glories of the Acropolis (1-12; 4 82 illus.).

C. Music Among the Greeks (5-302).

D. Influence of religion. A survey of the Greek gods and goddesses will be found in the Mythology Outline (8-156). See also Olympic Games (5-508; 4-71); Oracles (*f.i.*; 3-69).

E. The work of the Philosophers (6 160). Socrates (7 81); Plato (6-222); Aristotle (1 228).

VII. CIVIL WARS AND DECLINE OF THE POWER OF THE CITY STATES.

A. Peloponnesian Wars (4-77; 7-124) establish Spartan supremacy.

B. Leadership Passes to Thebes (7-266).

VIII. GREECE UNDER MACEDONIAN RULE.

A. Philip of Macedon (7-267; 4-77; 1-98) builds up a great military power.

B. Alexander (1-98), Philip's son, becomes a world conqueror.

a. Subjugation of Persian Empire, including Egypt (6-131).

b. Alexander carries Greek culture to most of known world.

C. Sunset glory of Greece—the Hellenistic Age (4-77).

a. In Egypt. Alexandria (1-101; 3 200) becomes literary and scientific capital of world.

b. Art and Literature of Hellenistic Age (4-91; 1-209).

c. Development of Science (4-92; 5-209).

IX. GRECIAN WORLD ABSORBED BY ROMAN EMPIRE (6-430).

Rise and Fall of the Roman Empire

I. BEGINNINGS OF ROME.

A. Sunny Italy : the generous mistress of the Mediterranean. Italy was more hospitable than Greece to the enterprises of men. The sunny hill-sides of the Apennines sloping to the western Mediterranean could support a large population; communication was not difficult. If the lack of good harbours tended to keep the early Romans at home, it also kept invaders away.

B. Inhabitants of ancient Italy.

a. The Etruscans (3-305), who seem to have had close connexion with Asia.

b. The Latins (6-429). Entered Italy from north, belonged to same stock (Indo-European) as invaders of Greece.

C. Founding of Rome. Nothing definite is known

of the founding of Rome, as there is little historical evidence to support the legends of Aeneas (1-25) or of Romulus and Remus (6-429; 5-136).

D. Progress and prosperity of Rome under Etruscan rule (6-429).

E. Etruscan Kings expelled (6-430). Story of Horatius (6-429; 5-59; 2-62).

II. THE REPUBLIC.

A. Long fight waged by common people (Plebs) against the ruling aristocracy (Patricians) for political power (6-429).

B. Military conquest and territorial expansion.

a. All Italy comes under Roman rule.

1. Defeat of Pyrrhus at Beneventum leads to capture of Greek colonies (6-314; 6-430).

HISTORY

2. Wise political organization of conquered territories aids governmental stability (2-388).
 3. Story of Cincinnatus (2-388).
 - b. Triumph in Punic Wars gives Rome naval supremacy.
 1. Carthage—its rise and fall (2-255).
 2. Hannibal - a genius in victory and defeat (4-127; 2-255; 6-232).
 - c. Other Conquests. With Carthage defeated, the way was now clear for the conquest of a Mediterranean empire; victory followed victory; and sooner or later most of the known world fell before the Roman legions: Syracuse (1-208); Spain (7-105); Greece (6-430); the East (6-258); Gaul (3-433).
- C. Collapse of the Republic.
- a. Civil War, a period of personal rivalries and class struggle (6-433); Spartacus (*f.i.*) slave revolt. During this period many famous characters appeared: Cicero (2-387); Pompey (6-258); Antony (5-129) and Cleopatra (2-407).
 - b. Julius Caesar masters the Roman world and becomes "Imperator" (2-161; 6-433).
- ### III. THE EMPIRE.
- A. First Century of Imperial glory.
- a. Augustus (1-308) encourages intellectual and Imperial development.
 - b. Nero (5-367), last of the Augustan line, ends the century.
- B. Second Century of Imperial glory: empire reaches greatest extent (*map*, 6-433).
- a. Conquest of Britain (2-73).
 - b. Destruction of Jerusalem (6-45).
 - c. Marcus Aurelius, the Emperor-philosopher (5-123).
- C. Life in Imperial Rome.
- a. Luxury the keynote of Roman life. Everyday affairs in Pompeii (6-256); performances of gladiators (4-25; 2-404).
 - b. Practical Progress.
 1. Modern improvements two thousand years ago: public baths (6-429 *illus.*); aqueducts and water supply (1-188; 6-446 *illus.*).
 2. Greatest system of communication in the ancient world: roads (6-404); postal service (6-270); lighthouses (4-502).
 - c. Artistic Achievements.
 1. Roman architects modify Greek style and develop engineering technique (1-209).
 2. In sculpture and painting also, the Romans followed Greek models (6-520).
- d. Latin Language and Literature (4-449).
1. Golden Age of Latin literature: Cicero (2-387), the great prose stylist (4-450); Horace (4-193) and Virgil (7-402), poets.
 2. Silver Age. "Meditations" of Marcus Aurelius (5-123), a classic of all ages.
- e. Religion. In religion, too, the Romans borrowed from the Greeks. For a survey of the Roman gods and goddesses, consult the Mythology Outline (8-156).
- ## IV. DECLINE AND FALL OF THE EMPIRE.
- A. Internal Decay.
- a. Emperors under control of army.
 - b. Constantine (2-488) ends the political power of Rome by removing capital to Byzantium and building Constantinople (2-148).
 1. This paved the way for the formal division of the Empire (6-439).
 2. Justinian I preserves Roman Law in famous code (2-148; 4-457; 5-199).
 - c. The Byzantine Empire (2-148) at Constantinople. This empire is chiefly interesting in connexion with Roman history because it preserved for posterity the classic culture that was destroyed in Rome.
- B. The Coming of the Barbarians: Beyond the last Roman outposts restless peoples were ever eager to push into the southern lands of sunshine and plenty. Centuries before, the Gauls had ravaged Italy and even sacked Rome (6-430). With the weakening of the Roman military power these tribes began to pour into the Empire.
- C. Fall of Rome.
- a. Visigoth victory at Adrianople foreshadows doom of Rome (4-49).
 - b. Rome is captured by Alaric (4-49).
 - c. Pope Leo I saves city from ravages of Huns under Attila (4-208; 1-306).
 - d. Theodoric the Ostrogoth establishes short-lived rule in Italy (4-49).
 - e. Vandals plunder by land and sea (7-379).
 - f. Lombards found kingdom in Northern Italy (5-19; 4-306).
- D. The Christian Church takes up the burden dropped by the dying Empire.

MEDIEVAL HISTORY

I. CHARLEMAGNE'S EMPIRE.

A. Foundation of the Frankish Empire.

- a. Clovis (3-449) unites all Franks and conquers land that is modern France. The conversion of Clovis to Christianity (5-199) led to Frankish support of the Pope.
- b. Charles Martel (2-309) saves Europe from Mahomedan conquest at Tours.

B. Charlemagne (2-305), the empire builder of the Middle Ages.

- C. Disruption of Charlemagne's empire the starting point of modern Germany and France. Charlemagne's son, Louis the Pious, was unable to maintain order in the vast domain left to him, and upon his death his three sons divided his lands between them—the Partition of Verdun (3-313, 387, 449; 4-5,188). Louis the German

HISTORY

received the portion east of the Rhine; Charles the Bald, that west of the Rhône and Scheldt, Lothair, the middle strip including north Italy.

II. THE MEDIEVAL CHURCH.

- A. Bishop of Rome, as Pope, becomes the most powerful ruler of the Middle Ages (4 306).
- B. Work of the monks and monasteries (5 243).
 - a. Preaching order of Dominicans (4 263).
 - b. The Friars, begging orders (5 215, 214 illus.), including Franciscans (3 457).

III. FEUDALISM.

- A. The Feudal System (3 348) grew up after the collapse of Roman government.
 - a. General causes of feudalism. This system was not peculiar to Europe, it has often grown up in countries where the central government has been weak, e.g. in Japan (4 344).
 - b. The castle (2 256) was the stronghold of feudalism.
 - c. Rule of "might makes right" general in England, France, Germany.
- B. Life under the Feudal System.
 - a. Knighthood and chivalry (4 417).
 - 1. Armour (1 413) heraldry (4 164)
 - 2. Life in the castle (2 256), the importance of the minstrels, courtly sport of falconry (4 141)
 - b. Country life. System of land holding (3 348), dependent position of serfs (7 65), agricultural methods (1 70 illus., 72 73)
 - c. Town life. Fairs and markets (2 404), Flemish wool trade (4 203), Hanseatic League (4 128), guilds, medieval organizations for protection of trade and industry (4 103).
- C. Decline of Feudalism. Black Death (1 478) breaks down agricultural system (1 77), effects of Crusades (3 1), Peasants' Revolt (7 339; 7 505), invention of gunpowder (4 418), rise of infantry and professional armies (1 68), invention of printing (2 283, 284; 4 486).

IV. CULTURAL DEVELOPMENT OF THE MIDDLE AGES.

- A. Literature embodied in Minstrels' Songs.
 - a. Survivals: Tales of King Arthur (1-256), Robin Hood (6 416), Song of Roland (4 434, 454).
 - b. Froissart the Chronicler (3 477).
 - c. Books (4-488 illus.) and Libraries.
- B. Beginnings of the Modern Drama. Pageants, Miracle and Mystery Plays (3 317).
- C. Architecture and Art.
 - a. Gothic architecture (1-211), cathedrals (2-264), stained glass; sculpture (6-520).
 - b. Other arts. Painting; tapestry making (7 224); ivory carving; illumination of books (5-116, 117).
- D. Living Conditions. Meagre house furnishings and floor coverings; inadequate and often impure water supply; bread (2 50); meals (5-152); medicine (5-304); bad roads (6-490).

E. Education carried on by the Church.

- a. Medieval universities (7 367, 368).
- b. Importance of Abélard (1-3) and Roger Bacon (1 341).

V. THE CRUSADES.

- A. The East at the time of the Crusades.
 - a. Byzantine Empire, the stronghold of culture in Europe.
 - b. Rising tide of Islam, or Mahomedanism (5 87). Movement into Europe through Spain (7 105) checked at Tours in 732 (2 309).
- B. The Crusades (3 1).
 - a. Causes. Seljuk Turks capture Jerusalem, threaten Constantinople, and stop pilgrimages to Palestine.
 - b. General character.
 - 1. Famous leaders. Richard the Lion-hearted (6 398); Saladin (6 488); Louis IX of France (5 41), Frederick Barbarossa (3 2), Philip Augustus (6 155; 3 2).
 - 2. Corruption into economic crusades
 - 3. Part played by Crusading Orders (3 2; 4 418).
- C. Effects. Agriculture improved by introduction of new plants, use of so called Arabic (really Indian) notation (5 90, 475; 4 250).

VI. GROWTH OF MONARCHY IN FRANCE.

- A. Capetian Kings begin Unification of France (3 449). When Hugh Capet came to the throne, the kingly power was disputed by great barons, of whom the Duke of Normandy was the most powerful, Henry I fails to subdue vassals; how the Northmen conquered Normandy (3 314, 5 448)
 - a. Louis the Fat brings order to France by defeating feudal barons (5 40).
 - b. Philip Augustus conquers Normandy from John of England (3 449) (Normandy and England had the same ruler after the Duke of Normandy conquered England in 1066)
 - c. Louis IX's administrative reforms (3 450).
 - d. Philip the Fair calls the first States-General (3 467)
- B. Hundred Years' War (4 203).
 - a. Cause. English claims to France.
 - b. How the war was fought.
 - 1. Royal leaders (4 203).
 - 2. Important battles: Crécy (2 527, 4 204); Poitiers (4 204, 203 illus., 1-480); Agincourt (1 68, 4 163, 204); first use of cannon.
 - 3. Joan of Arc (4 376; 2 308, 4 204) saves France.
 - c. Effects in France (3 450).

- C. Growth of Absolute Monarchy under Louis XI (5 41, 2 309; 3-314). Defeat of Charles the Bold, Duke of Burgundy (3 387; 2-97; 5 41).
Note: For Outline of the history of England in the Middle Ages, see 8-127.

VII. THE EMPIRE AND THE PAPACY.

- A. The Beginnings of the Holy Roman Empire (4-187).
 - a. Coronation of Charlemagne, the "central fact of the Middle Ages" (3-450 illus.).

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b. Conflict between Popes and Emperors (4-308). Since both Pope and Emperor claimed that their power was derived from God, a difference in interests was bound to lead to a conflict.

c. Revived under Otto I (4-7; 3-314; 4-188). For the next few centuries the history of Germany and of Italy became that of the Empire and the Papacy.

B. Great Investiture Conflict.

Begun by the Emperor Henry IV and Pope Gregory VII (Hildebrand) (4-96; 4-308). Settled by Concordat of Worms.

C. Quarrels of the Hohenstaufens and the Popes.

a. Fundamental causes. The office of Emperor was theoretically elective, and the Guelfs disputed the claims of the Hohenstaufens (Ghibellines). Since the coronation of the Emperor by the Pope was necessary to the imperial power, the Pope was forced to take sides in the disputes. The Hohenstaufens were the most formidable rivals of the papacy.

b. Frederick Barbarossa, one of the greatest of the emperors (4-7).

c. Innocent III strengthens the papal position, humbles John of England (4-378).

d. Frederick II (4-7) restores Hohenstaufen House; cultural development of this period in Naples and Sicily.

D. Golden Bull establishes a "Constitution" for the Empire (4-8); hinders growth of centralised government in Germany.

VIII. FALL OF THE EASTERN (BYZANTINE) EMPIRE.

A. Rise of the Ottoman Turks (7-333).

B. Fall of Constantinople (2-149). This put an end to the Byzantine Empire and gave the Turks undisputed control of the eastern Mediterranean and of a large corner of Europe; it stimulated the era of exploration and discovery by forcing western Europe to seek new ways of reaching the Far East.

MODERN HISTORY

The Renaissance

I. FORERUNNERS AND CONTRIBUTING CAUSES.

A. Crusades (3-1): Contact with Eastern culture stimulated thought of Crusaders.

B. Invention of Printing (6-288; 4-486) and more general use of paper promoted interchange of ideas.

C. Growth of Creative Impulse as shown in Medieval Architecture (1-209).

b. Italian Masters: Giotto (4-21); Ghiberti (*f.i.*; 3-392); Leonardo da Vinci (4-482); Michelangelo (5-190); Raphael (6-363); Titian (7-282); etc.

c. The Church a patron of art: The Borgias (2-17); Leo X (5-160).

B. Northern Artists: Durer (3-138); Holbein (4-185; 3-259).

C. Architecture: Return to the classic styles (6-388).

II. LITERARY RENAISSANCE.

Study of classical learning and beginnings of national literatures (6-384).

A. In Italy (6-384).

a. Dante (3-45), the forerunner of the Renaissance.

b. Revival of Greek and Latin hampers distinctly national literature (6-384, 386).

B. North of the Alps (6-386, 387).

a. France: Froissart the Chronicler (3-477; 3-455, 454 illus.).

b. England (6-387): early influence of Chaucer (2-311), and Wycliffe (7-505) on English language; Sir Thomas More (5-262; 3-124 illus.) and the Oxford Reformers.

III. ARTISTIC RENAISSANCE.

A. In Italy (6-368).

a. Florence the centre of the movement (4-313, 317); patronage of the Medici (5-160).

IV. BEGINNINGS OF SCIENCE.

A. Roger Bacon (1-341) who foreshadowed experimental science.

B. Advance in Astronomy:

a. Copernicus (2-501), the founder of modern astronomy.

b. Galileo (3-498; 5-162; 4-330) continues work of Copernicus.

C. Important Inventions: compass (2-474); gunpowder (3-329).

V. EXPLORATIONS AND DISCOVERIES.

A. Prince Henry the Navigator (*f.i.*) and the Portuguese in the East (4-251; 2-297).

a. Bartholomew Diaz discovers the Cape of Good Hope (1-53; 2-215; 7-89).

b. Vasco da Gama reaches India by sea (7-382).

B. Columbus (2-467) discovers America.

C. Magellan (5-77) circumnavigates the world (1-133).

The Reformation and Religious Wars

I. CAUSES OF THE REFORMATION (6-376).

- A. Effect of the Renaissance (6-387). Social and political unrest in Germany; printing and translation of Bible into national languages.
- B. Forerunners of the Reformation: Wycliffe (7-505) and the Lollards; John Huss (4-211) attacks corruption of the Church in Bohemia; influence of Erasmus (8-295).

II. POLITICAL AND SOCIAL CONDITIONS OF EUROPE.

- A. Consolidation of Spain.
 - a. Marriage of Ferdinand and Isabella (4-301).
 - b. Moorish power broken (7-105).
 - c. Charles V rules the Holy Roman Empire and all Hapsburg possessions (4-129; *f.i.*).
- B. French Designs on Italy.
 - a. Battle of Ravenna (*f.i.*; 6-368).
 - b. Savonarola (6-500) preaches moral and religious revival.
 - c. Invasions of Italy distract attention from religious revolt.

III. REFORMATION BEGINS IN GERMANY.

- A. Germany was ready for the Reformation.

- B. Luther (5-58) and his teachings (6-376; 5-53).

- C. Peace of Augsburg (6-377) ends civil wars. Since this peace left to each ruler the right to establish either Lutheranism or Catholicism, many of the people who disagreed with their rulers were forced to emigrate.

IV. CALVINISM.

- A. In Switzerland.
 - a. Zwingli (7-528) preaches radical reform. In the disagreement between Zwingli and Luther lay the germ of much future Protestant dissension.
 - b. Calvin (2-178) and his teachings.
- B. Huguenots (4-201) in France.
 - a. Persecutions and St. Bartholomew Massacre (6-400).
 - b. Henry IV and Edict of Nantes (5-316).
 - c. Richelieu (6-400) destroys political power of Huguenots.

- C. In Scotland. John Knox (4-423) founds Scottish Presbyterianism.

Note: For the Reformation in England, see 8-129.

Period of Civil Strife

I. SPAIN AND THE REVOLT OF THE NETHERLANDS.

- A. Catholic Policy of Philip II (6-155).
- B. Fight for independence of the United Provinces against Spain. William the Silent (7-454). Treaty of Westphalia (1-417; 5-380).

II. COUNTER-REFORMATION.

- A. Churchmen attempt to end abuses. Savonarola (6-500).
- B. Reform within the Catholic Church. Loyola (5-46) and the Jesuits; Francis Xavier (7-506).
- C. The Inquisition (4-263).

III. THE THIRTY YEARS' WAR (7-269).

- A. Last Great Religious War spreads from German Empire into all Europe.
 - a. Gustavus Adolphus (*f.i.*), the Protestant champion. Originates modern army (1-248).
 - b. Richelieu (6-400) aids Protestant cause. By this time the religious significance of the war had been lost sight of.
- B. Results of War.
 - a. Religious question settled in Germany.
 - b. Terrific devastation of countries that had been fought over.

Note: For the Civil War, Commonwealth, and Restoration in England, see 8-130.

Struggle for Power and Possessions

I. THE AGE OF LOUIS XIV IN FRANCE.

- A. Louis XIV, the *Grand Monarque* (5-42).
 - a. Inherits strong monarchy, built by Richelieu (6-400) and Mazarin (5-150). Absolutism illustrated by incident of the "Man in the Iron Mask" (4-296).
 - b. Persecution of the Huguenots (4-201).
 - c. Foreign policy—wars to extend French power. Louis systematically paid foreign court officials and even rulers to support his cause, bribing for instance James II, King of England.
- B. French Society during Reign of Louis XIV.
 - a. Court at Versailles. Spectacular extravagance (5-42); art under royal patronage (3-439).
 - b. Golden age of French literature (3-453). Corneille (*f.i.*); Molière (5-231); Racine (6-334); Voltaire (7-406).

II. STRUGGLE TO MAINTAIN BALANCE OF POWER.

- A. What "Balance of Power" means. From the 15th century there appeared in European politics a new theory, that of the "Balance of Power"—the maintenance of an equal balance among the nations of Europe. Louis XIV threatened this balance of power.
- B. War of the Spanish Succession (7-105).
 - a. Marlborough, the great English general (5-131).
 - b. By the Treaty of Utrecht, 1713, Britain obtained Gibraltar, Newfoundland, Nova Scotia, etc.
- C. War of the Austrian Succession (1-326).
- D. Seven Years' War (7-2).
 - a. Preceded by diplomatic revolution. France and Austria against Prussia and Great

HISTORY

Britain; importance of Chatham (2-309); weak rule of Louis XV (5-43).
b. Overseas contest. In America (7-2); in India (2-411; 7-2).
c. Results of the war. Extension of British Empire at the expense of France; gains by Prussia. *

III. RACE FOR COLONIAL EMPIRES.

A. Results of Discoveries. The discoveries of new lands in the western hemisphere led Spain, Portugal, the Dutch Republic, Britain, and France to seize areas in the New World. Claims to the new territories were based upon priority of discovery and settlement.

B. Spanish America.

a. Columbus (2-467) establishes Spanish claim to New World. Explorations continued by Balboa (1-348); Ponce de Leon (*f.i.*); Amerigo Vespucci (1-132).

b. Spain's empire : In South America (7-98); West Indies; Central America (2-292); Mexico (2-513; 1-134; 5-188).

1. Conquest of native peoples. Cortes (2-513) in Mexico; Pizarro (6-210) in Peru.
 2. Las Casas, Dominican monk, protector of the Indians (*f.i.*).

c. Spanish colonial policy was one of ruthless exploitation.

C. Portugal obtains great colony of Brazil (2-49).

D. French Explorers in North America. Cartier; Champlain; Marquette; Joliet; La Salle (*all in f.i.*).

E. Other Settlements in North America.

Dutch Colonies in New World (5-416, 421).

Note : For British exploration and settlement, and colonial results of the Seven Years' War, see 8-131.

Rise of Prussia and Russia

I. THE BEGINNINGS OF PRUSSIAN POWER.

A. Early Duchy under the Hohenzollerns (*f.i.*). Prussia had been converted to Christianity by the Teutonic Knights (*f.i.*).

B. Frederick the Great (3-462) raises Prussia to state of first rank.

a. Seizure of Silesia and Seven Years' War (7-2).
b. Partition of Poland (3-463).

II. FORMATION OF THE RUSSIAN EMPIRE.

A. Russia before Peter the Great.

a. Early leadership of Kiev (6-473).
b. Mongol invasion shuts off contact with Western Europe (6-474).
c. Grand Dukes of Muscovy reorganize Russia (6-474).

B. Peter the Great (6-145). One man changes a medioeval empire into a modern state (6-474; 4-479).

a. Defeat of Charles XII of Sweden (6-146).

b. Baltic provinces annexed.

C. Catherine II (6-474) continues Peter's policies.

a. Seven Years' War (7-2).
b. Shares in partition of Poland (3-463). Kosciuszko, Polish patriot (6-240).
c. Ambitions along the Black Sea.

III. LESSER EUROPEAN STATES IN THE EIGHTEENTH CENTURY.

A. Decline of Spanish Power.

B. Italy without political unity. Bourbons (2-28) succeed Hapsburgs (4-129) in Naples and Sicily.

C. Weakness of Austria. After the death of the Emperor Charles V, Austria was ruled by the Austrian branch of the Hapsburgs.

a. Conflict among the different peoples of the Austrian Empire.

b. Reign of Maria Theresa (5-125); loss of Silesia; Seven Years' War (7-2); partition of Poland (3-463).

The French Revolution and Napoleon

1. REVOLUTION IN FRANCE (3-466).

A. Sources of the Revolutionary Movement.

a. Influence of Liberal thinkers. Voltaire (7-406); Rousseau (6-459); the Encyclopedists (3-245, 466).
b. Abuses of the old régime (3-451, 466).
c. Failure of reforms under Louis XVI (5-43). Influence of Marie Antoinette (5-125).

B. Overthrow of the Old Régime.

a. Meeting of the States-General; Bastille stormed and social revolution (3-467); serfdom ended; royal family escorted to Paris.
b. Constitution drawn up. Declaration of the Rights of Man (3-468).
c. Leaders: Mirabeau (5-224); Lafayette (4-486); Talleyrand (7-220).

d. Flight of king leads to abolition of monarchy. Execution of Louis XVI.

C. Reign of Terror (3-469). Government by the Convention (3-451).

a. Dominated by Jacobins (4-334). Robespierre (6-414); Danton (3-47).

b. Control by terrorism. Execution of Lavoisier (4-457); Marie Antoinette; Jean Paul Marat (5-120; 3-469).

D. Directory Established (3-452).

a. Wars with foreign powers. The hostility of France's neighbours to the revolutionary spirit had brought on a whole series of wars (3-452, 469).

b. Napoleon Bonaparte, the "man of the hour" (5-318).

HISTORY

Marriage to Josephine Beauharnais (4-383); campaigns under the Directory; Egyptian campaign (5-318).

II. NAPOLEONIC ERA.

- A. Bonaparte overthrows the Directory and establishes the Consulate (3-469).
 - a. Wars against second coalition (5-318).
 - b. Peace of Amiens (1-139; 5-319).
 - B. Napoleonic Empire.
 - a. Imperial conquests extended over most of Europe. Naval power crushed at Trafalgar (7-304).
 - b. Napoleon as statesman.
 - c. Effects of Continental System: in Europe (5-322); in United States it led to war with Britain in 1812.
 - C. Napoleon's downfall through national risings and military reverses.
 - a. Peninsular War (6-116); retreat from Moscow (5-322, 321 illus.).
 - b. Hundred Days (*f.-i.*) and Waterloo (7-428).
 - c. Exile to St. Helena.
- ### III. CONGRESS OF VIENNA, 1814-15, AND PERIOD OF REACTION.
- A. Partition of Napoleonic Empire among European

powers (3-315, 316 illus.). Work of Talleyrand (7-220) for France.

- B. Formation of Grand and Holy Alliances. The Quadruple (Grand) Alliance (*f.-i.*) was formed by Austria, Russia, Prussia, and Great Britain; the last subsequently withdrew, and France was included.
Note: In reconstructing Europe the Congress of Vienna was guided by dynastic rather than national claims. The representatives of the old aristocracy in seeking to restore the "balance of power" sowed the seeds of later conflicts.
- C. Age of Metternich. For thirty years after the Congress of Vienna, the moving spirit of European politics was Prince Metternich (1-326; 3-315; 4-314; *f.-i.*), the Austrian statesman. He was the consistent foe of democracy and set his face against any suggestions of change.
- D. Decline of Reactionary Power.
 - a. United States proclaims Monroe doctrine (*f.-i.*).
 - b. Successful war of independence against Turkey in Greece (7-335).
 - c. Revolution of 1830 in France (3-453) overthrows Charles X (2-309).

The Industrial Revolution

I. OLD INDUSTRIAL CONDITIONS.

The Renaissance had had little effect on the everyday life of the people. Nearly all the work of the world was done by hand labour with a few simple tools; communication was slow and hazardous; the masses of the people continued to live in the same hard and comfortless conditions as they had done from the earliest times right through the Middle Ages. Then, in about a generation, the adoption of a few practical inventions brought about the industrial revolution (4-259) and radically changed living conditions.

II. HOW THE CHANGE CAME ABOUT.

- A. Inventions in spinning and weaving.
 - a. Hargreaves (4-132) invents spinning jenny (1-239; 7-130). Improvements by Arkwright (1-239) and Crompton (2-533).
 - b. Cartwright (2-255) invents power loom.
 - c. Whitney's cotton gin adds impetus to textile industry (2-518).
- B. Invention of Steam-engine fills great industrial need; Watt, father of the steam-engine (7-431).
- C. Rise of the Factory System (2-353; 4-259).

D. Improvement in Communications.

- a. Building of Roads (6-404; 5-57) and Canals (2-204).
- b. Application of steam-engine (7-152) to transport. Fulton (3-488) applies steam to navigation; locomotives (5-1) and railways (6-354); Stephenson's locomotive (7-155; 5-1 illus.).
- c. Use of Electricity (3-210). First English telegraph line (6-311), submarine cables unite continents (2-152).
- E. Improvement of Agricultural Methods (1-78). Better ploughs, reaping machines; introduction of rotation of crops; increased care in breeding farm animals; changes improve supply of food.

III. SOME RESULTS OF THE INDUSTRIAL REVOLUTION.

- A. Factory System (4-260) supplants home industry.
- B. Large-scale Capitalism (*f.-i.*) develops.
- C. Trade Union (7-304) movement grows.
- D. Social Conscience develops, leading to legislation prescribing factory conditions, hours of labour for adults, restriction of child labour, etc.

Europe in the Nineteenth Century

I. DEMOCRACY AND REACTION IN FRANCE.

- A. Bourbon Restoration under Louis XVIII (5-43). Reactionary policies of Charles X (2-309) and the Revolution of 1830 (3-453).
- B. Louis Philippe, the Citizen King (5-44).
- C. Revolution of 1848 and Second Republic (3-453).
- D. Napoleon III and the Second Empire (5-323).
 - a. Foreign policy: participates in Crimean War; aids Italy against Austria; interferes in Mexico.

b. Domestic administration marked by prosperity and public improvements; Paris rebuilt.

E. Franco-Prussian War (3-458) and the Third Republic.

- a. Germany crushes France; siege of Metz (5-185); disaster at Sedan (3-459; 5-185).
- b. Third Republic (3-453). Commune of Paris suppressed (3-453, 459).

HISTORY

II. FOUNDING OF THE GERMAN EMPIRE.

- A. Revolution of 1848 seeks democratic and united government.
- B. Bismarck (1-474) builds Prussia's power. Schleswig-Holstein seized (3-74); Seven Weeks' War with Austria and formation of North German Confederation (*f.i.*).
- C. Franco-Prussian War (3-458); Empire proclaimed.
 - a. Germany defeats France in short campaign.
 - b. Germany united as a Hohenzollern empire—the First Reich (4-8).

III. FORMATION OF AUSTRIA-HUNGARY.

- A. Revolution of 1848 in Hapsburg lands.
 - a. Kossuth leads rising in Hungary (4-207).
 - b. Insurrection in Italy led by Sardinia-Piedmont (4-316).
 - c. Revolt in Bohemia (1-326).
- B. Francis Joseph begins long reign (*f.i.*).
 - a. Loss of Italian provinces.
 - b. Defeated by Prussia in Seven Weeks' War.
- C. Dual Monarchy formed (1-325).

IV. UNIFICATION OF ITALY (4-316).

- A. Mazzini (5-151) and the Republic of Rome.
- B. Victor Emmanuel II (4-316) and his great minister, Cavour (*f.i.*).

- a. Garibaldi (3-504) and his "thousand red-shirts."
- b. Pope Pius IX (6-210) opposes the new kingdom.

V. OTHER EUROPEAN COUNTRIES.

- A. Scandinavia.
 - a. Denmark. Loses Norway after Napoleonic Wars (5-465); Prussia and Austria seize Schleswig-Holstein (3-74).
 - b. Sweden. Loses Finland (3-355); regains Norway (5-465).
 - c. Norway becomes an independent kingdom (5-465).
- B. Iberian Peninsula.
 - Spain loses most of colonial empire. Insurrections in Cuba (3-6) and war with United States (7-362).
- C. The Low Countries.
 - a. Kingdom of the Netherlands created, 1815 (1-417).
 - b. Revolt of southern Netherlands, 1830 (1-417).
 - c. Kingdom of Belgium recognized, 1839. Leopold II (4-484) secures Congo (1-418).

Note: For Great Britain in the 19th century, see 8-130.

Africa and Asia

I. SCRAMBLE FOR TERRITORY IN AFRICA.

- A. Exploration discloses vast resources (1-54). Livingstone (4-526) and Stanley (7-144). Leopold II, king of the Belgians (4-484), starts the race to secure territory in Africa (1-55; 1-418; 2-481).
- B. Subsequent European acquisitions in Africa (1-55).

II. EUROPEANS IN CHINA.

- A. China opened to Foreigners through Treaty ports (2-373). Great Britain obtains Hong Kong (4-191) through Opium War (5-521).
- B. Exploitation by Foreign Powers.
 - a. Defeat by Japan leads to foreign intervention (1-272).
 - b. German holdings in Shantung (7-17).
 - c. Manchuria (5-112) falls under Russian, and later Japanese, influence.
 - d. "Open door" (*f.i.*) agreement saves national integrity.
- C. Revolution of 1911 establishes republican government, 1912 (2-373).

III. RUSSIA TURNS TO THE EAST.

- A. Reaction after the Crimean War (6-474).

- a. Alexander (6-474), the "Tsar liberator," frees the serfs.
- b. Return of repressive measures. Growth of Nihilist movement (6-474) Tolstoy (7-289) and his teaching.

B. Advance in Asia.

- a. March to the Pacific.
 - Trans-Siberian Railway links St. Petersburg (later renamed Leningrad) with the Pacific (6-472); influence extended through Manchuria (5-112; 6-474).
- b. Central Asia.
 - Conquest of Turkestan; pressure on Indian border—Afghanistan (1-46) a buffer state.

IV. TRANSFORMATION OF JAPAN.

- A. Contact with the West.
 - a. Marco Polo's visit (4-344).
 - b. Matthew Perry's expedition (4-344; 1-272).
- B. Wars with China (4-349).
 - Chinese attitude towards Japan (1-272).
- C. Russo-Japanese War (4-350; 6-474) makes Japan a world-power.
 - a. Annexation of Korea (4-425; 1-272; 4-340).
 - b. Japanese influence in Manchuria (5-112).

HISTORY

The Twentieth-Century World

I. EUROPE 1900-14.

A. Division of Great Powers (3-316).

a. Triple Alliance between Germany, Austria, and Italy. A serious weakness of this alliance lay in the fact that Italy was linked with its ancient enemy Austria, which still held territories claimed by Italy (*Italia Irredenta*, "Unredeemed Italy"); Italy had joined the alliance from pique when France seized Tunis.

b. Triple Entente of France, Russia, and Great Britain. Originally an alliance of Russia and France, it was enlarged to include Great Britain during the reign of Edward VII (3-169).

B. Industrial growth makes Germany serious trade rival of Britain.

a. William II (7-453) backs economic ambitions with militarism.

b. African colonial possessions (1-55) developed.

c. Berlin-Baghdad Railway (1-346) started.

C. Hague Peace Conferences, 1899 and 1907, attempt to combat militarism.

D. Revolution in Portugal (6-260).

E. Turkey loses most of its European territory.

a. Austria annexes Bosnia and Herzegovina (2-20).

b. Balkan Wars (3-316): territorial gains of Greece (4-78); Serbia (6-532); Montenegro (5-250); Rumania (6-470).

II. THE FIRST WORLD WAR.

A. Causes.

a. The Spirit of Aggression. The fundamental cause of the catastrophe was the aggressive nationalism which had been steadily growing in the great European states. International relations were essentially competitive. In the half-century of diplomacy before 1914 national ambitions found an outlet in imperialistic colonial enterprises and a military rivalry that turned Europe into an armed camp, despite the opening in 1913 of the Palace of Peace at The Hague (4-116).

b. The Spark that started the Blaze. The immediate cause was the crisis due to the assassination of the Archduke Francis Ferdinand (1863-1914), heir to the Austrian throne (1-326; 6-523).

For the military operations by land, sea, and air, and the general course of the War, reference should be made to the article on the First World War (7-478), to those on the various countries concerned, and to the chronologies and list of battles in the Fact-Index under World Wars.

B. Peace Conference at Versailles (7-484).

a. Representatives from all Allied and associated powers, but it was dominated by

"big four": Lloyd George of Britain (4-531); Clemenceau of France; Woodrow Wilson of the U.S.A. (7-455); Orlando of Italy (*f.i.*).

b. Other influential delegates: Borden of Canada (*f.i.*); Smuts of South Africa (7-72); Venizelos of Greece (4-78).

c. Treaty of Versailles with Germany. Subsidiary treaties with Austria, Hungary, Bulgaria, Turkey (Sèvres, Lausanne, 7-484).

d. League of Nations (4-463) established.

III. RUSSIAN REVOLUTION.

A. How the Revolution was accomplished (6-474).

B. Abdication of Nicholas II (5-431; 3-317).

C. Bolshevik Leaders: Lenin (4-478); Trotsky (7-318).

D. Disruption of the Empire. Loss of Finland (3-355); Estonia (6-477); Latvia (6-478); Lithuania (6-478); Russian Poland; parts of White Russia and of the Ukraine (6-240); Bessarabia (6-478).

IV. YEARS BETWEEN FIRST AND SECOND WORLD WARS.

A. Germany.

a. The Weimar Republic, led by Stresemann (4-9).

b. Rise of Hitler (4-181) and Nazi (National Socialist) Revolution (4-10; 5-328).

c. Re-militarisation of Rhineland (4-10).

d. Occupation of Austria (1-324; 4-10).

e. Munich Crisis and Agreement (3-24; 4-10; 4-184 5-296; 7-486).

f. Occupation of Czechoslovakia (3-24; 4-10).

g. Seizure of Memel (3-318; 7-486) and Danzig (3-49).

B. Empire of Austria-Hungary dissolved (1-326).

a. The "succession states": Austria (1-322); Hungary (4-205); Czechoslovakia (3-21).

b. Borderlands lost: South Tirol (Trentino-Alto Adige) to Italy (7-280); Austrian Poland to Poland (6-240); Bosnia, Herzegovina, Dalmatia, Croatia, Slovenia to the kingdom of the Serbs, Croats, and Slovenes (later called Yugoslavia) (1-326; 7-519); Transylvania and Bukovina to Rumania (6-470).

c. Austria and Czechoslovakia occupied by Germans (4-10; 1-324; 3-24).

C. Italy.

a. Rise of Mussolini (5-310) and Fascist Revolution (3-341; 4-316).

b. Conquest of Abyssinia (1-7; 4-317).

c. Rome-Berlin Axis formed (7-485; 5-311).

D. Spain.

a. Alfonso XIII (1-102) expelled (7-110) and republic proclaimed.

HISTORY

b. Civil War (7-110); Franco (3 457; 2 28) becomes dictator.

E. Turkey, under Mustafa Kemal Pasha (later Atatürk, father of the Turks) (4 396) becomes a westernised republic.

F. Russia.

a. Civil war between "reds" (Bolsheviks) and "whites" (Tsarists) (6 476).

b. Russia cut off from West by political differences.

c. Stalin (7-141) succeeds Lenin; five year plans (6-476).

d. Non-aggression pact between Germany and Russia (4-183; 6 476).

G. The United States of America.

a. Congress fails to ratify Treaty of Versailles (7-362) and the U.S.A. remains outside the League of Nations. Concludes a separate peace with Germany in 1921.

b. "Slump" of 1929-32 (7-362).

c. President F. D. Roosevelt (6 449) and the New Deal (7 362, 363).

H. Japan renews attack on China.

a. Occupies Manchuria (1 272; 4 350). Sets up puppet state of Manchukuo (5 112).

b. Invades China proper without declaring war (4-350).

I. League of Nations (4 463) proves impotent against aggression, failing to prevent:

a. Japan's aggression against Manchuria (4 350; 5-112).

b. Hitler's re-occupation of the Rhineland.

c. Mussolini's attack on, and conquest of, Abyssinia (1-7; 4 317).

V. THE SECOND WORLD WAR, 1939-45.

A. Causes.

With Russia under Stalin (7 141) isolated to the east, Spain under Franco (3 457) to the south-west, and the United States too much concerned with its own problems of recovery from the desperate economic setback of the slump of 1929-32 (7-362), the United Kingdom and Franco found themselves faced with aggressive dictators in Germany (Hitler: 4 181) and Italy (Mussolini: 5-310). Germany, admitted to the League of Nations in 1926, withdrew from it in 1934 (4-10); Italy, an originating member, treated with contempt the half-hearted attempt made by the League to impose "economic sanctions" (that is, prevent Italy from obtaining certain valuable imports) in an effort to hinder the Italian attack on Abyssinia (1-7). Convinced that France and the United Kingdom would never take up arms to resist their aggressions, the two dictators became steadily bolder (see p. 127, under Germany and Italy). After Hitler annexed Memel (3-318) in March 1939, Britain entered into a pact of mutual assistance

with Poland, and France declared that it would stand by the Franco-Polish treaty of 1925 if Poland were attacked. But, drunk with success, certain that neither France nor the United Kingdom would keep its pledge, Hitler sent his forces across the Polish frontier on September 1, 1939. The United Kingdom and France declared war against Germany on September 3.

B. For the general course of the war, see the article on the Second World War (7 486). Refer also to the articles on the countries involved, commanders, battles, and places that figured in the fighting. The Fact-Index contains chronologies and a list of battles under the entry World Wars.

VI. AFTER THE SECOND WORLD WAR.

A. Occupation of Germany (4 11) and of Austria (1-324) by the United Kingdom, the United States, France, and Russia; W. Germany and Austria regain their sovereignty in 1955, Austria as a neutral state.

B. United Nations (7 354) inaugurated in London, 1946.

C. Peace treaties concluded, 1947, between the Allies and Finland; Bulgaria (2 121); Hungary (4 208); Italy; Rumania (6 171). (See also Japan in page 129.)

D. Soviet Russia emerges from Second World War embracing all lands of the Tsarist Empire (except part of Finland) plus the northern half of East Prussia (6 472; 4 4); Poland has new frontiers (map, 6 239).

E. Communist governments seize power in Albania (1 92); Bulgaria (2 121); Czechoslovakia (3 24); Hungary (4 205); Poland (6 241). Rumania (6 471); Yugoslavia (7 520).

F. Fourth Republic established in France.

G. Tension between Communist Russia and its western Allies (6 477).

a. "Marshall Aid" (5 137; 7 363) accepted from the U.S.A. by countries of Western Europe; refused by countries of Eastern Europe.

b. Treaty of Brussels, 1948, between Britain, France, Belgium, the Netherlands, and Luxembourg, beginning of Western Union (*f.i.*).

c. North Atlantic Treaty, 1949, signed by Brussels Treaty powers, the United States, Canada, Norway, Denmark, Iceland, Portugal and Italy; North Atlantic Treaty Organization (5-457; 3-319; 7-354, 363, 498) established; Greece, Turkey, W. Germany admitted.

H. Tension in the Near East.

a. Jewish state of Israel (4-302) set up; hostility of Arabs (1 193).

b. Egypt: anti-British feeling (3-180); revolution (3 181, 182) and proclamation of republic.

c. Persia nationalises oil; agrees to international consortium 1954 (6-132).

HISTORY

- I. Japan occupied by the Allied (chiefly American) forces (4-350); peace treaty, 1951.
 - a. South Sakhalin and the Kuriles occupied by Russia.
 - b. Ryukyu and Bonin Islands, and former Japanese mandated territories in the Pacific, occupied by United States.
- J. Communists gain control of China (2-375); Nationalist government takes refuge in Formosa (2-333, 375; 3 424).
- K. Korea (4 425) freed from Japan and occupied by Allies.
 - a. North, occupied by Russians, adopts Communist government; South, occupied by other Allied (chiefly American) forces, adopts western form of government.
- L. Independence secured in Far East by:
 - a. British India: see India (4-254) and Pakistan (4 254; 6 39).
 - b. Ceylon (2 297).
 - c. Burma (2-130).
 - d. Indonesia (4 257).
- M. Struggle in French Indo-China against Communist Vietnamese forces (7-400).

BRITISH HISTORY

- I. TO THE END OF THE MIDDLE AGES.
 - A. Early History.
 - a. Roman Britain (2 73; 3 275).
 - b. Anglo-Saxon invasions (3 276); Christianity returns (3 276); Alfred, the first great English king (1-103); Danish invasions (3 166; 3 276); Canute (2 215) rules all England; Saxon line restored in person of Edward the Confessor (3-106).
 - B. Norman Conquest.
 - a. Normans under William the Conqueror defeat Harold at Hastings; death of Harold (3 276; 4-133).
 - b. Norman rule established (3 276). Feudalism (3 348) reaches height under Stephen (7 154).
 - c. Results of conquest. While the Norman Conquest brought Continental influences to England, in the end the Normans became Anglicised (5 449).
 - C. Growth of Constitutional Government.
 - a. Beginning of systematic government under Henry II (4 161).
 1. Attempt to regulate the clergy fails (1 401); jury trials extended (4 162).
 2. Administrative reform continued by Richard I (6-398).
 - b. Magna Carta (5-80), the Great Charter that made the king amenable to the law, extorted from John (4 378) by rebellious barons.
 - c. Growth of parliamentary power. Simon de Montfort (5 252) calls the First Parliament (6-86); result of Barons' war against Henry III (4 162); Model Parliament (6-86; 3-167); Edward I (3-166) encourages idea of law and order; Parliament divided into two houses (6-86; 3-167); Parliament under Edward II (3-167) begins to restrict the power of the king; quarrels with Richard I (6-399).
 - D. England reaches out for more territory.
 - a. Edward I attempts to unite Scotland and England (6-512). Resisted by Wallace (7-415) and Bruce (2-96), Scottish heroes.
 - b. Conquest of Wales (7 413).
 - c. Loss of Normandy (5 449) under John left Aquitaine (*f.i.*) chief English possession in France.
- Black Death (1 478) causes decline of serfdom; Peasants' Revolt (7 339, 505).
- Birth of a National Spirit.
 - a. Effect of the Hundred Years' War (4 203). This struggle was carried on by armies recruited to serve the "national interest," not by personal retainers to further the design of their feudal lord.
 - b. Beginnings of a national literature (3 284). Chaucer (2 311); Wycliffe (7 505) produces an English Bible; John Gower (*f.i.*); William Langland (*f.i.*).
- Wars of the Roses (6 453). Resulted in establishing powerful Tudor (7 323) line, first of whom was Henry VII (4 163).

II. REFORMATION IN ENGLAND.

- Wish of Henry VIII (4-163) for a divorce leads to break with Rome (2 381).
 - a. Opposition of Sir Thomas More (5 262).
 - b. Underlying issues: The changes under Henry VIII had to do with Papal control rather than religious reform; Protestant doctrines had little influence before Edward VI (3 167).
- Catholic Reaction under Queen Mary I (5-140). Tragedy of Lady Jane Grey (4-97).
- E. Elizabeth I (3 230) secures England's position as Protestant kingdom.
 - a. Mary Queen of Scots (5 141) centre of Catholic movement.
 - b. Defeat of Spanish Armada (1-240) marks the beginning of British sea-power.
 - c. Elizabethan Age in literature (3-284), Shakespeare (7-12); Francis Bacon (1 340); Ben Jonson (4 382); etc.

HISTORY

III. QUARRELS BETWEEN STUART KINGS AND PARLIAMENT.

- A. James I (4-338) attempts to rule by "Divine Right."
- B. Charles I (2-306) continues the policy. John Hampden (4-123) leads resistance to ship money. Long Parliament (2 307 ; 3 278) begins.
- C. Failure to settle Religious Question.
 - a. Gunpowder Plot (3 343 ; 4 339) to blow up Parliament.
 - b. Persecution of Puritans (6 311) and "great migration."
 - c. Bishops' wars in Scotland (6 512).

IV. CIVIL WAR, COMMONWEALTH, AND PROTECTORATE.

- A. Parliament leads War against King (2 306 ; 3-278). Scotland aids Parliament (6 512).
- B. Cromwell (2 533) in Power.
 - a. King Charles is put to death (3 278).
 - b. Irish rebellion crushed (4 282) ; the "levelers" (2 534).
- C. Age of Puritan and Cavalier in literature.
 - a. Influence of King James's Bible (1-443).
 - b. Great Puritan writers (3 286, 287) ; Milton (5-209) ; Bunyan (2 125).

V. THE RESTORATION.

- A. Charles II (2-307) seeks absolute power.
 - a. Habeas Corpus Act (4-115) passed.
 - b. Growth of sea-power in war with the Dutch Republic (2-308).
- B. James II (4-339) attempts to secure Catholic restoration.
- C. The Glorious Revolution of 1688 (5-132 ; 3-280).

VI. CONSTITUTIONAL MONARCHY ESTABLISHED.

- A. William III (7 452) and Mary II (5 140) re-establish Protestant rule. Bill of Rights (1 446) fixes supremacy of Parliament. Toleration Act begins peaceful adjustment of religious rights.
 - a. Union of Scotland and England (3 281 ; 6-513).
 - b. Age of Queen Anne (1 158). Marlborough (5-181) and the War of the Spanish Succession (3-281) ; period of intellectual activity ; rise of newspapers and periodicals (5 403) ; Dryden (3-129) ; Pope (6-258) ; Swift (7-204) ; Sir Isaac Newton (5 408).
- B. Limitation of King's power under early Hanoverians.
 - a. Growth of Cabinet government (2-151 ; 4-50). Work of William Pitt the elder (Lord Chatham) (2-309).
 - b. Whigs strengthen position of House of Commons.
- C. Reaction under George III (3-521).
 - a. Dismissal of Chatham and close of Seven Years' War (7-2).
 - b. Failure of Tory colonial policy (7-361) ; Burke (2-129) the champion of Whig policies towards America.

- D. Wars with Revolutionary France and Napoleon (3-452, 469 ; 5 318.)

- a. Work of William Pitt the younger (6-208).
- b. Nelson (5-368) secures British supremacy at sea.
- c. Wellington (7-436) and the battle of Waterloo (7 428).

- E. War of 1812 with United States (7-361).

VII. GREAT BRITAIN IN THE NINETEENTH CENTURY.

- A. Beginnings of Political and Social Reforms.
 - a. Industrial Revolution brings demand for more democratic government and remedy of social abuses (4 259).
 - b. Catholic Emancipation (6-105). The laws prohibiting "Dissenters" from holding office had already been repealed ; in 1858 political privileges were extended to the Jews.
 - c. Reform Act of 1832 (6 88 ; 7-407, 453) transfers political power to middle classes.
 - d. Repeal of Corn Laws (3 12 ; 6-105), and establishing of Free Trade.
- B. Victorian Age.
 - a. Influence of Queen Victoria (7-395).
 - b. Crimean War (2 532) and western support of Turkey.
 - c. Neutrality in American Civil War (*f.i.*) Arbitration on Alabama claims.
 - d. Social Changes : Suffrago extended in 1867 and 1884 ; secret voting adopted (1-356). Employers' Liability Act, 1880 ; Trades Union Congress founded (7-304). Elementary education made compulsory (4-26) ; admission to universities allowed without religious test (4 26).
 - e. The Irish problem (4 283). Gladstone (4-26) attempts to solve it ; work of Parnell (6 91)

VIII. GREAT BRITAIN IN THE TWENTIETH CENTURY.

- A. Edward VII (3-169).
 - a. Edward the Peacemaker's exceptional knowledge of the men and movements of his time was of the greatest service in British foreign policy ; Entente with France ("Entente Cordiale," *f.i.*).
 - b. Old Age Pensions introduced (6-120).
- B. George V (3 522).
 - a. First World War (7-478).
 - b. Name of Royal House changed to Windsor (3-522).
 - c. Ties between Crown and Dominions strengthened (2-84).
 - d. Statute of Westminster (2-84) defines equality of status of self-governing Dominions with mother country.
 - e. Irish Free State created (4-283).
 - f. National Health and Unemployment Insurance (*f.i.*) introduced ; House of Lords' veto restricted (6-88) ; women given the vote (7-407).

HISTORY

C. Edward VIII (3-169). . Abdication.

D. George VI (3-522).

a. New Constitution in Irish Free State (Eire) (4-283); Eire severs last link with U.K. in the Republic of Ireland Act, 1949 (4-284).

b. Second World War (7-486).

c. India (4-254), Pakistan (4-254), and Ceylon (2-297) granted dominion status, India later becoming a republic. Burma (2-180) becomes independent republic.

d. Fighting in Malaya (5-97); Kenya (4-400); Korea (4-426).

e. National Health Service (*f.-i.*); Labour govt. introduces nationalisation of coal, electricity and gas, transport, civil aviation. All plural voting abolished (7-407); House of Lords' veto further restricted (6-88).

E. Elizabeth II (3-233).

Coronation (2-509, 511 illus.; 3-235 illus.); Commonwealth tour (3-234).

The British Commonwealth

Great Britain acquired a world-wide empire more or less by accident. There was never any concerted government policy to go out and seize territory in the lands that began to come within European knowledge from the 15th century onward. Venturesome seamen and explorers, hardy settlers, energetic traders carried the British flag to the Americas, to Asia, to Australia, to the Pacific, and were followed by troops and officials sent out, often grudgingly, by the home government. In the 18th century Britain lost one empire—now the United States—through the stupidity of the government in London; during the 19th and 20th centuries a new British Empire was consolidated by the granting of ever increasing self-government to the separate peoples within it.

A. British Exploration and Settlement.

a. Early voyages the basis of English claims. John Cabot (2-156); Drake (3-113); Hudson (4-199; 6-242; 1-136).

b. Early colonising enterprises. Raleigh (6-362) founds a colony; founding of the Thirteen Colonies (7-361; 2-82); Hudson's Bay Company (4-200).

B. Colonial Results of the Seven Years' War (7-2) between England and France.

a. In America. French lose Canada.

b. In the East. British control established in India. Work of Clive (2-411); continued by Warren Hastings (4-136).

C. British Empire in Africa.

a. Occupation of Egypt (3-176). Share in control of Suez Canal (3-176; 7-181); conquest of Anglo-Egyptian Sudan (3-178); "Chinese" Gordon (4-47) and Kitchener (4-415).

b. Control of South Africa. Boer War (1-502); work of Cecil Rhodes (6-393).

D. Growth of the Empire.

a. Disraeli (3-93) lays foundation of modern British imperialism. Half-share in control of Suez Canal (7-181).

b. Indian Mutiny (4-252). Victoria crowned Empress of India.

E. Trusteeship Territories. Former German colonies in Africa and the Pacific mandated by League of Nations to Britain, Australia, and New Zealand after First World War; placed under United Nations Trusteeship after Second World War.

I. CANADA.

A. Exploration and Early Settlement.

a. First Explorers (1-136). John Cabot (2-156); Cartier (*f.-i.*); Henry Hudson (4-199).

b. Beginnings of settlement. First French settlement at Nova Scotia; Champlain founds Quebec (6-321); founding of Montreal (5-255).

c. Extension into interior. Marquette and Joliet (*f.-i.*); La Salle (*f.-i.*).

B. Conflict of French and British.

a. British claims to Canada. Nova Scotia (5-460) and Newfoundland (5-394). Hudson Bay (4-200) region.

b. Hudson's Bay Company, a rival to French fur-trading interests (4-200; 3-496).

c. Seven Years' War (7-2) ends French rule in Canada. Deportation of Acadians (5-470). Wolfe (7-465) and Montcalm (5-249) at Quebec.

C. A Century of British Rule.

a. Development of Self-Government. Rebellion of 1837. Papineau leads French in Lower Canada (6-321); Mackenzie in Upper Canada; union of Upper and Lower Canada with a responsible government: the Act of Union was passed by the British Parliament upon the recommendations of Lord Durham, whose report upon British North America became the basis of Britain's system of imperial government.

b. Westward Expansion.* Mackenzie (*f.-i.*) organizes North-West; Hudson's Bay Company and the fur trade (3-496); early colonisation of Manitoba (5-114; 7-461).

D. Under Dominion Government.

a. Territorial Expansion. Purchase of territory of Hudson's Bay Company. Organization of Manitoba precipitates Red River Rebellion (5-115). British Columbia (2-80) joins federation. Canadian Pacific Railway (6-358, 359 illus.) opens western prairies to settlement. Yukon organized (7-520).

b. Imperial Relations. Participates in the Boer War (1-502); in the World Wars (7-481, 486, 494-6, 497 illus., 499 illus.).

II. AUSTRALIA.

A. Early Visitors.

a. Luis de Torres and Tasman (1-317).

b. Dampier (3-36; 1-317).

HISTORY

- D. Captain Cook (2 494).** Cook the "real discoverer" of Australia (1-317).
- C. Exploration of Interior.** E. J. Myre (*f.-i.*; 6 322).
- D. Early Settlement.**
 - a. New South Wales (5-402) founded.
 - b. Discovery of gold (1-318; 4-39).
 - c. Penal settlements (1-318).
- E. Federal Constitution adopted** (1-318).
- F. Australia participates in World Wars** (7 480, 486, 489, 490, 493, 494).

III. NEW ZEALAND (5 422).

- A. Discovery and Exploration.**
 - a. Tasman (1-317; 5 425).
 - b. Captain Cook (2 494).
- B. First Settlements.**
 - a. Place of call for whalers (5 425).
 - b. Missionary founds a colony (5 425).
 - c. Wars with, and eventual acceptance of, the Maoris (5 425; 5 79 illus.; 7 230 illus.).
- C. New Zealand participates in World Wars** (7-180, 486, 489).

IV. AFRICA.

- A. South Africa.**
 - a. Early European visitors : Diaz (1 53; 2 215; 7 89); Vasco da Gama (7 382).
 - b. Beginnings of settlement : Dutch East India Company founds plantation near Table Mountain (1 51; 2 84); pioneers trek into interior; Cape Colony (2 84) becomes British.
 - c. The Great Trek (1-51). Boers set up independent republics beyond the Vaal and Orange rivers; Battle of Majuba Hill (1-502).
- B. British West Africa** (2 84).
- C. British East Africa** (2 84).
- D. Rhodesia and Nyasaland** (6 394; 1-55; 2-84).

V. ASIA.

- A. British East India Company (*f.-i.*).**
 - a. In India.
 - b. In Malaya.
- B. Acquisition of Ceylon** (2 297).
- C. Conquest of Burma** (2-130); independence granted.
- D. India, Pakistan, Ceylon gain Dominion status.** India becomes a republic within the Commonwealth.
- E. Malaya formed into a federation** (5 93).
- F. Singapore** (7-56).

UNITED STATES OF AMERICA

I. BIRTH OF A NATION.

- A. Independence.**
 - a. Independence declared (7-361); George Washington (7-420); Benjamin Franklin (3-460).
 - b. Government under the Articles of Confederation, drawing-up of the Constitution (7-361).
- B. The Early Years.**
 - a. Triumph of the Democratic Republican Party. Louisiana Purchase (4-358; 5-222; 7-361) opens up vast possibilities of expansion. War with Britain, 1812-14 (7-361).
 - b. Era of Good Feeling :
 - 1. Expansion of territory : Florida (3-393) purchased (7-361).
 - 2. Monroe Doctrine (*f.-i.*) formulated—the basis of American foreign policy (7-362).
 - c. Administration of John Quincy Adams (*f.-i.*). Beginnings of Whig and Democrat Parties.
- C. The Civil War.**
 - a. Rise of the Movement for the Abolition of Slavery (7-66).
 - b. Election of Lincoln (4-511) to Presidency : the Civil War (*see* American Civil War in *f.-i.*).
 - c. Reconstruction.

II. FOREIGN POLICY AND GROWTH OF A COLONIAL EMPIRE.

- A. Fishery Disputes.** Disputes over Newfoundland fisheries and Bering Sea seal fisheries settled.
- B. Beginning of Pacific Island Interests.**
 - a. United States shares in division of the Samoan Islands (6 494).
 - b. Annexation of Hawaii (4 139).
- C. Development of the Monroe Doctrine.**
 - a. France forced to withdraw from Mexico (5 186).
 - b. Arbitration in British-Venezuelan boundary dispute.
 - c. Hostility of South America softened by Pan-American movement (7-101); Monroe Doctrine recognized by League of Nations.
- D. Spanish-American War** (7-362).
- E. Panama Canal** (6-53).
- F. American Contributions to International Peace.**
 - a. Policy of international arbitration.
 - b. Stands aside from the League of Nations (4-463; 7-362, 456).
 - c. An originating member of the United Nations (7-354).

HISTORY

G. U.S.A. and the World Wars (7-362, 363, 482, 491).

III. INTERNAL AFFAIRS IN THE TWENTIETH CENTURY.

A. Theodore Roosevelt inaugurates an era of reform; combats trusts.

B. Woodrow Wilson (7-455) fails to bring the U.S.A. into the League of Nations.

C. The Prohibition Era (1 96; 2 335).

D. F. D. Roosevelt (6-449) and the "New Deal."

E. President Truman (7-321) and President Eisenhower (3-206) in office (7 363).

The States of Latin America

A. SOUTH AMERICA.

South America was discovered by Columbus (2-467) and for 300 years was ruled partly by Spain, partly by Portugal, which held Brazil. Latin America now comprises ten republics; British and French Guiana, and Surinam (Dutch Guiana). The history of each country is given in the respective articles: Argentina (1 223); Bolivia (1 507); Brazil (2 45); Chile (2 357); Colombia (2 457); Ecuador (3-160); Paraguay (6 76); Peru (6-138); Uruguay (7-370); Venezuela (7 384); Guiana (4-101).

See also the articles on Pizarro, Spanish conqueror of Peru (6-210), and the Incas (4 237), rulers of Peru before the Spaniards arrived.

B. CENTRAL AMERICA.

Discovered by Columbus (2-467), conquered by Spain (Cortes, 2 513); now consists of six republics, together with British Honduras. For particulars of their history see Guatemala (4 101); Salvador (6-492); Nicaragua (5 430); Honduras (4-190); Costa Rica (2-514); Panama (6-52); British Honduras (4-189).

C. MEXICO (5 186).

See also the article on the Aztecs (1 331), and references in the Fact-Index to the Maya and Toltec peoples.

NOTE : For History Charts, showing what was happening at the same time in different parts of the world, *see* pages 134-146.

Interest-Questions in History

How is it known that 10,000 years ago some European lakes were inhabited by men ? 5 109.

How did a pick and shovel make a myth come true ? 7-319.

Why was India not conquered by Alexander the Great ? 1-99.

How did Alfred the Great defeat the Danes ? 1 103.

Who is thought to have discovered America 500 years before Columbus ? 1 132.

How did science keep the Romans out of Syracuse for three years ? 1 208.

How did Aristides help to banish himself ? 1-227.

What great philosopher through one pupil sent the culture of his country throughout the civilized world ? 1-223.

How did Sir Francis Drake "sing the Spanish king's beard" ? 1 210.

What great king was overthrown by Cortes in the New World ? 2 513.

What European king personally owned an African state ? 2-481.

What great English essayist, philosopher, and statesman was convicted of receiving bribes ? 1-310.

Why did the Portuguese give Bombay to England ? 1 515.

What explorer received ten pounds for discoveries in the New World ? 2-156.

How did English become the dominant language in Canada ? 2 200.

Why did a king of England order the sea to flow back ? 2 215.

What early Frank put down anarchy ? 2-305.

Why did the old Venetian rulers throw a wedding ring into the sea every year ? 1-20.

What king owed his throne to a girl general ? 4-376.

What early government always had two kings at the same time ? 7-124.

How can stones tell the progress of Man ? 7-164.

How did a thistle save the Scots from Norse invaders ? 7 279.

How did being blind in one eye help a famous English naval officer to victory ? 5-363.

What great explorer was killed by the natives of Hawaii ? 2-405.

What famous early explorer was cast adrift by his men to perish in the Arctic ? 4-200.

How was Greek influence brought to India ? 1-99; 4-251.

How did a king and queen give to Europe a new nation and to the world a new continent ? 4-301.

Who were the first merchants to come to England for tin ? 3-275.

What statesman escaped from his beleaguered capital by balloon ? 3 459.

How did a single monk stop the gladiatorial contests of ancient Rome ? 4 26.

What English queen reigned only nine days and died on the scaffold ? 4 97.

What beautiful queen conquered two great warriors with her charms but failed with the third ? 2 107.

What foreign minister of France was able to keep his position through the Directory, the Napoleonic empire, and the restored Bourbon monarchy ? 7 220.

Who was the earliest European to describe the city of Hangchow, China ? 4 136.

How did the Northmen finally conquer the English from the south instead of the north ? 4-133.

How did throwing a king's representative out of a window involve Europe in 30 years of war ? 7-269 illus.

What Tsar worked in a shipyard ? 6-116.

What Spaniard accepted a ransom of gold and silver to the value of £3,000,000 for a great Indian chief, and then killed him ? 6-211.

What early European served Kublai Khan ? 6-255.

What great Mahomedan leader is remembered because of his courtesy and kindness of heart ? 6 458.

When was Florence a city of Puritans ? 6 500.

What did the scallop shell worn as a badge by pilgrims in the Middle Ages signify ? 6-502.

What Scottish queen was forced to abdicate in favour of her infant son ? 5 142.

Who were the first Europeans to visit Japan ? 4 314.

When did "tanks" first go into action ? 7-223.

Which was the first Christian nation to abolish the slave trade ? 7-66.

What was the date of the first Labour Government in Britain ? 4 427.

Who was first President of Turkey ? 4-396.

When was the Zulu power broken ? 7-527.

When did "bobbies" wear top-hats ? 6-105 illus.

When was the present Vatican State constituted ? 7-382.

HISTORY SHOWN IN CHARTS

THE following charts have been drawn up to show at a glance the events occurring in different parts of the world at the same time. It should be noted that they are drawn up according to the Christian calendar, which dates events as so many years before the birth of Christ (B.C., meaning before Christ) or after it (A.D., *anno Domini*, meaning in the year of the Lord). The people who lived before Christ did not, of course, think of themselves as living in, for example, 1000 B.C., they had other

ways of reckoning chronology, differing in different parts of the world. The Christian calendar, moreover, did not come into use until the 8th century A.D., long after Christianity had become the accepted religion of the Roman Empire; and is to day only the chief of several calendars in use. Mahomedans, for instance, count A.D. 622, when Mahomet fled from Mecca to Medina, as their year 1. Nearly all dates before the first millennium B.C. are approximate, although scholars are increasing their accuracy.

ANCIENT HISTORY

B.C.	EGYPT	WESTERN ASIA	MEDITERRANEAN	E. ASIA
3500	c 3200 According to tradition Menes (or Mena) the first Pharaoh, united Upper and Lower Egypt, and founded the I Dynasty. c 3200-2780 ARCHAIC PERIOD : Dynasties I and II	c 3000-2750 Age of Sumerian city states constantly at war with one another. A kind of writing called cuneiform develops.		c 3500 First walled city settlements in China.
2999	c 2780-2240 THE OLD KINGDOM , or Pyramid Age. Dynasties III to VI. Zoser (III Dynasty) builds Step Pyramid near Memphis. Khafra (or Khops), Khafra, and Menkaure (IV Dynasty) build the Pyramids at Giza, and the Sphinx. c 2240-2160 Period of weak central government, provincial governors rule independently. The XI Dynasty, princes of Thebes, restore unity. c 2160-1740 THE MIDDLE KINGDOM : Dynasties XII to XIV. The XII Dynasty conquered Nubia as far as the 2nd cataract.	c 2650 Sargon, king of Akkad, makes himself master of the whole plain from the Persian Gulf to the Mediterranean Sea. c 2500 Troy a rich city. c 2500-2200 Sumer (South Babylonia) and Akkad (North Babylonia) ruled by Semitic Kings. c 2000 Armies from Egypt and Mesopotamia fought in the great plain of Esdraelon, Palestine. Persia inhabited by agricultural and pastoral peoples, mainly of Semitic stock.	c 2000 Egyptian influence established in Crete.	c 2800 Pictographic writing in China. 2600 Calendar established in China, star catalogue compiled. c 2500 Cities of Mohenjo Daro and Harappa in the valley of the Indus flourishing.
1999	Following the XIII Dynasty a period of confusion led to c 1710-1580 The rule of the Hyksos Kings, conquerors from Asia, driven out by princes of Thebes, who founded c 1590-1000 THE NEW KINGDOM : Dynasties XVIII to XX. c 1500-1450 During the XVIII Dynasty Thothmes III extends Egyptian rule over western Asia to the banks of the Euphrates. c 1400 Amenhotep III, the Magnificent, builds temples to Amon at Luxor and Karnak. c 1375-1358 Akhnaton, name taken by Amenhotep IV, called the heretic, with his queen Nefertiti, attempts to replace the worship of numerous deities (of whom Amon was the chief) by that of one—the sun disc Aten. Most of Egypt's possessions in Asia were lost under Amenhotep III and Akhnaton. c 1352 Tutankhamen, Akhnaton's son-in-law, restores the worship of Amon. During the XIX Dynasty. c 1313 Seti I constructs a canal linking the Mediterranean with the Red Sea. c 1300-1235 Ramses II fights the Hittites in vain for the recovery of Egypt's Asiatic possessions, frontier set south of the Lebanon. This Pharaoh was a great builder (the Ramesseum, the rock temple of Abu Simbel).	1900-1600 FIRST BABYLONIAN DYNASTY : ruled also Assyria c 1830-c 1810. c 1710 Under Hammurabi, sixth in the line, kingdom of Babylonia reaches its height, a code of laws formulated and inscribed on a block of stone (found in 1904-02 and now in Paris). c 1750 Abraham lives at Ur, in Southern Babylonia. c 1600-1150 Babylonia conquered and ruled by Kassites, who introduced horse into Western Asia. c 1500-1450 Thothmes III of Egypt conquers Asia to the river Euphrates threatens Babylonia. c 1400 Burnaburiash king of Babylonia makes a treaty with Buzur Ashir, king of the rising state of Assyria. 1380-1341 Ashurbanalit increases status of Assyria. c 1300 Assyria struggles for mastery of Western Asia.	1500-1200 Mycenaean age, with Mycenae and Tiryns important centres of culture. c 1400 Crete attacked by Dorians from the main land (now Greece) who destroy Knossos and then turn north-eastward to attack Troy. Cretan civilization disappears.	c 1500 Indus valley civilization overthrown by Aryan invaders from central Asia.

ANCIENT HISTORY (continued)

B.C.	EGYPT	WESTERN ASIA	MEDITERRANEAN	E. ASIA
1999 (contd.)	<p>c. 1300. Horse represented for first time in Egyptian sculpture (Hypostyle Hall, Karnak)</p> <p>c. 1225-1200. Under Merenptah, son of Rameses II, Moses probably led the Israelites out of Egypt.</p> <p>c. 1200-1170. Rameses III, founder of XX Dynasty, successfully defends Egypt against the "Peoples of the Sea" from Asia Minor and the Aegean; victory commemorated in his temple at Medinet Habu.</p> <p>c. 1090-663 Dynasties XXI to XXV. The country, under weak Pharaohs, is again divided.</p>	<p>c. 1100 Palestine invaded by the Philistines, from whom the country took its name.</p> <p>c. 1050 Saul becomes king of Israel</p> <p>c. 1000 Assyrians conquer Persia.</p> <p>c. 1000 David, king of Israel, conquers Jerusalem and makes it his capital.</p>	<p>c. 1000 Hellenes in occupation of all Hellas - Greek peninsula, Aegean sea, coasts of Asia Minor</p>	<p>1200. An-Yang capital of all China.</p> <p>c. 1200 The Rig-Veda compiled in India.</p> <p>1100. Chou dynasty (reigned 900 years) begins in China.</p> <p>1000. Hao becomes Chinese capital.</p>
999	<p>c. 730. Foreign invaders from the south gain control of Egypt and set up the XXV (Ethiopian) Dynasty.</p> <p>671. Esarhaddon of Assyria conquers Egypt and makes it an Assyrian province.</p> <p>663 Psammetichus, governor of Sais and Memphis, rebels and founds XXVI Dynasty, followed by the XXVII.</p> <p>609-593. Necho, attempting reconquest of former Egyptian Empire, is routed at Carhemish 605 by Nebuchadnezzar crown prince of Babylon.</p> <p>525-404. Period of rule by Persia, after defeat of Psammetichus III at Pelusium, 525, by Cambyses, king of Persia.</p>	<p>973-933. Reign of Solomon in Israel</p> <p>933. Israel divided into two kingdoms (north, Israel; south, Judah).</p> <p>883-850. Ashur-nasir-pal II of Assyria reaches the Mediterranean; takes tribute from cities of Phoenicia</p> <p>745-727. Tiglath-pileser III of Assyria forces Israel to acknowledge his overlordship, 734, captures Damascus, 732, conquers Babylonia, 729, and rules it (under name Pul), thus making Assyria greatest empire of the time</p> <p>722-705 Sargon II destroys Israel and takes its people captive, builds a new capital near Nineveh.</p> <p>705-681 Sennacherib destroys city of Babylon, 689; extends and improves Nineveh.</p> <p>691-608 Esarhaddon allows rebuilding of Babylon; conquers Egypt, 671.</p> <p>60-625. Ashurbanipal loses Egypt to Psammetichus, 603, he collected a great library of cuneiform tablets at Nineveh</p> <p>c. 650. Medes, an Aryan people, rebel against Assyrian overlords and set up Median Empire (in what is now Persia)</p> <p>625-538. CHALDEAN OR NEW BABYLONIAN EMPIRE.</p> <p>612-605. Assyria invaded by Chaldeans from the south-east and Medes from the east; Nineveh destroyed, end of the Assyrian Empire, 605, divided between Nabopolassar of Chaldea and Cyaxares of Media</p> <p>605. Nebuchadnezzar, son of Nabopolassar, defeats Necho, Pharaoh of Egypt, at Carhemish; makes Judea subject to Babylonia</p> <p>604-592 Nebuchadnezzar II; captures Jerusalem, 597 and 586, and takes many Jews captive; lays siege to Tyre, 85-573. Built the Hanging Gardens of Babylon.</p> <p>549-529. Cyrus the Great (a Persian) overthrows the Median Empire, 549, becoming king of Persia, which he extends from borders of India to the eastern Mediterranean and into Egypt.</p> <p>538. Babylon captured by Gobryas, a general of Cyrus; captive Jews allowed to return to Judah</p> <p>538-332. Babylonia under Persian rule.</p> <p>525. Cambyses, son of Cyrus, conquers Egypt.</p> <p>521-485. Darius the Great seizes the Persian throne 521; divides his empire into twenty provinces each ruled by a satrap.</p>	<p>814 Traditional date of foundation of Carthage.</p> <p>753 Foundation of Rome by the legendary Romulus.</p> <p>640-614 Ancus Marcius, fourth legendary king of Rome, founds Ostia (port of Rome) and subdues Latin tribes.</p> <p>600. Hellas composed of a number of small city states, 6th century B.C., the age of the tyrants.</p> <p>509 Rebellion led by Julius Brutus drives the tyrant Tarquinus Superbus from the throne of Rome; Rome becomes a republic.</p> <p>509. Commercial treaty between Rome and Carthage.</p>	<p>c. 800-600. The Vedas compiled in India; they teach division of mankind into castes.</p> <p>660. Traditional date of the founding of the Imperial dynasty of Japan.</p> <p>600-300. Upanishads compiled in India; they contain the doctrine of continuing reincarnation.</p> <p>600-250 Period of the Philosophers in China.</p> <p>c. 551. In China, Confucius born.</p> <p>c. 530 In India, Prince Gautama becomes the Buddha.</p> <p>517-509. Darius I of Persia seizes Gandhara (N. Punjab).</p>

ANCIENT HISTORY (continued)

B.C.	MEDITERRANEAN	W ASIA including EGYPT	E ASIA
500	<p>496 Battle of Lake Regillus, in which Rome crushes all the Latin tribes</p> <p>494 Plebians granted representation in Roman government (hitherto conducted by patricians)</p> <p>490 Greeks defeat Persians at Marathon</p> <p>480 Greeks defeat Persian fleet at Salamis</p> <p>479 Carthaginians defeated by Gelon tyrant of Syracuse in Sicily</p> <p>478 Greeks defeat Persian army at Plataea</p> <p>474 Etruscan fleet destroyed by Romans in war with the Greek city of Syracuse Sicily</p> <p>450 Roman laws engraved on 12 tablets of bronze</p> <p>431-404 Peloponnesian Wars between Athens and Sparta End in triumph of Sparta</p> <p>400 West in Sicily conquered by Carthage</p>	<p>492 Persian expedition against Greece wrecked on the coast of Macedonia</p> <p>490 Persian army defeated by the Greeks at Marathon</p> <p>480-465 Xerxes, son of Darius, suffers overwhelming defeat by Greeks 480 by sea at Salamis, 479 on land at Plataea, Ieronymus king of Sparta and 1000 men held the Pass of Thermopylae against the Persians 480 until overwhelmed by a treacherous attack in the rear</p> <p>404-332 Egypt semi-independent under XXXVIII to XXX Dynasties</p>	<p>433 Traditional date of Aryan conquest of Ceylon</p>
400	<p>296 Romans after 10 year siege take Etruscan stronghold of Vols</p> <p>390 Gauls capture and sack Rome</p> <p>367 One of Rome's two consuls to be a plebeian</p> <p>338 Battle of Chaeronea makes Philip of Macedonia master of Greece</p> <p>336-323 Reign of Alexander the Great (born 356) son of Philip of Macedonia</p>	<p>332 Alexander the Great breaks the power of Persia at the Battle of Issus</p> <p>332 Alexander the Great invades Egypt unopposed</p> <p>332-323 Persian Empire ruled by Alexander the Great</p> <p>323-31 Egypt ruled by the Ptolemys, founded by Ptolemy I Soter a general of Alexander the Great who took Egypt as his share when Alexander empire broke up and assumed the title king in 305 Palestine passed with Egypt to the Ptolemys who rule in Egypt ends with the death of Cleopatra (d. 30) at the Battle of Actium, 31</p> <p>312-171 Seleucids rule Babylonia also Persia until 227 when they lose it to the Parthians</p>	<p>326 Alexander the Great reaches the river Hydaspes (Jhelum)</p> <p>330 Chandragupta establishes Gupta dynasty in India defeats Seleucus Nicator Syria 323 and unites northern India</p>
300	<p>279 The Celts ravage Macedonia</p> <p>264-241 First Punic War Rome takes Sicily from Carthage</p> <p>237-229 Hamilcar of Carthage conquers south-east Spain</p> <p>218-201 Second Punic War Scipio Africanus defeats Hannibal at Zama and Carthage becomes a vassal state of Rome</p>	<p>276-272 First Syrian War Ptolemy II (282-246) extends Egyptian possessions</p> <p>260-253 Second Syrian War Ptolemy II loses part of conquered lands</p> <p>246-241 Third Syrian War Ptolemy III (246-241) acquires coasts of Syria and southern Asia Minor height of Ptolemaic power</p> <p>221-217 Fourth Syrian War Ptolemy IV (221-203) retains all former conquests except port of Seleucia</p> <p>201-195 Fifth Syrian War Ptolemy V (203-181) loses all Asiatic possessions except Cyprus</p>	<p>272-26 Asoka extends his empire over two-thirds of the Indian peninsula</p> <p>246 China state unites all China Burning of the books</p> <p>214 Great Wall of China built by linking earlier fortifications</p> <p>202 Han dynasty re-starts classical learning in China</p>
200	<p>107 Rome defeats Macedonia and begins to absorb Greek states Conquest complete 146</p> <p>179 The Forum at Rome founded</p> <p>140-146 Third Punic War Carthage razed to the ground 146 its territory made Roman province</p>	<p>171 Parthians conquer Babylonia</p> <p>171-138 Mithradates I extends Parthian empire from Caspian Sea to Persian Gulf from Afghanistan to the Tigris</p>	<p>200 The Mahabharata compiled in India</p>
100	<p>87-63 Wars against Mithradates VI king of Pontus Sulla defeats the king in Greece 86 Pompey drives him out of Pontus 63</p> <p>45 Gaius Julius Caesar appointed perpetual dictator</p> <p>44 Caesar murdered</p> <p>27 Gaius Julius Caesar Octavianus (Octavian) nephew and heir of Caesar assumes the name Augustus and position (though not title) of emperor (emperor) of the Roman Empire</p>	<p>64 Palestine becomes a Roman province</p> <p>31 B.C. A.D. 395 Egypt a part of the Roman Empire</p> <p>4 Probable correct date of birth of Jesus of Nazareth</p>	
TIME A.D.	<p>14-47 Tiberius</p> <p>37-41 Caligula</p> <p>41-54 Claudius</p> <p>43 Roman conquest of South Britain</p> <p>54-68 Nero</p> <p>69-79 Vespasian</p> <p>79 Destruction of Pompeii and Herculaneum by eruption of Vesuvius</p> <p>81-96 Domitian</p> <p>98-117 Trajan under whom Roman Empire reaches its greatest extent</p>		<p>8 Wang Mang usurps Chinese throne</p>

ANCIENT HISTORY—MEDIEVAL HISTORY

A.D.	MEDITERRANEAN	W ASIA including EGYPT	E ASIA
100	117-138 Hadrian 138-161 Antoninus Pius 161-180 Marcus Aurelius 193-211 Septimius Severus	121 Hadrian renounces Asiatic territories beyond Euphrates 192-195 Jewish rising under Bar Kokba 195-199 Septimius Severus conquers Mesopotamia	100 Buddhism introduced into China 141 Yellow Turban rebellion in China
200	254-305 Diocletian, who entrusts government of western part of the Empire to an associate, himself governing eastern part	226 Vassal kinglet Artaxerxes (a Persian) rebels, kills last Parthian king and takes over the Parthian empire, as first of the Sassanid dynasty, kings of Persia 227-641 Sassanid dynasty, kings of Persia Zoroastrian religion established 234 Goths invade Asia Minor 239 Shapur I of Persia seizes Vologases (Roman Emperor (231-244)) 244-302 Suses of Persia loses Armenia to Rome 297	220 Three Kingdoms in China 241 Chinese explore Indo China First official changes between China and Japan
300	312 Constantine the Great (reigned 306-337) orders toleration of Christianity 330 Constantine moves his capital from Rome to Byzantium which he renames Constantinople (now called Istanbul) and dedicates to the Virgin 395 Death of Theodosius the Great and separation of the Empire between his two sons into the Eastern or Byzantine Empire (capital Constantinople) under Arcadius (395-408) and the Western or Roman Empire (capital Rome) under Honorius (395-423)	301-379 Shapur II of Persia fights three wars with Rome, 337-350, 353-361, 371-379 Persia attains height of its power	360 Japan attempts conquest of Korea 386 First Tartar dynasty in China
MEDIEVAL	WESTERN EUROPE	BRITISH ISLES	OTHER COUNTRIES
400	400 Vandals migrate from middle Danube into Gaul and then into Spain, 401 (whence name Anglians) 410 Alaric, king of the Visigoths (West Goths) storms and sacks Rome, on his death the same year Visigoths retire from Italy and set up Gothic kingdom capital Toulouse extending from the Pyrenees to Galatia and from the Bay of Biscay to the Rhine 451 Attila the Hun defeated by Theodoric, king of the Visigoths (son of Alaric), near Troyes (traditionally at Châlons) 455 Genseric the Vandal sacks Rome 476 Emperor Romulus Augustulus deposed by Odoacer the German and of Western (Roman) Empire 486 Clovis the Merovingian gains control of all Gaul and founds kingdom of the Franks 489 Theodoric the Great, king of the Ostrogoths (East Goths), invades Italy, defeats Odoacer at his capital Ravenna, and puts him to death, 493, sets up kingdom of the Ostrogoths in Italy 496 Traditional date of conversion of Clovis to Christianity.	407 Roman legions leave Britain 432 Patrick begins conversion of Ireland to Christianity c. 440 First Jutes land in Thames estuary, set up kingdom of Kent (capital Canterbury) c. 475 First Saxons land on south coast of Britain, set up kingdom of Sussex or South Saxons (covering modern Sussex and most of Surrey), capital Winchester	428 Genseric leads Vandals into N. Africa, sets up a kingdom capital Carthage, later conquers Sicily, Sardinia, Corsica 474-491 Zeno emperor of Byzantium
500	507 Clovis defeats Visigoths at Vouillé north of Poitiers, they retain only small area 511 Death of Clovis, Frankish kingdom divided among his four sons, later made into kingdoms of Austrasia and Neustria 535-554 Gothic War Justinian's general Belisarius destroys kingdom of the Ostrogoths and sets up Byzantine governor in Ravenna, Italy devastated, Rome left a city of ruins 568 Lombards (Lombards) invade Italy, set up a kingdom in the north capital Pavia 590-604 Gregory I the Great Pope of Rome, the papacy assumes leadership in south Italy	c. 500 Saxons and Jutes conquer Isl. of Wight and (modern) Hampshire, basis of kingdom of Wessex (West Saxons) capital Winchester c. 520 First Angles land on east coast of Britain, set up kingdom of East Angles, capital Norwich, East of the three Germanic tribes to reach Britain the Angles came eventually in such numbers that the southern part of Britain acquired the name Angles land or England c. 530 Saxons and kingdom of Wessex (East Saxons), capital London c. 550 Angles found kingdom of Bernicia (from Pees to Lorth) c. 560 Angles found kingdom of Deira (covering modern Yorkshire and Durham) 563 Columba brings Christianity to Scotland from Ireland, founds monastery on Isle of Iona c. 580 Angles set up kingdom of Mercia (central England) 590 Columban of Leinster begins Irish Christian missions to Europe 597 Augustine reintroduces Christianity into southern England (introduced under the Romans the British Saint Alban being martyred at Verulamium c. 304, it had died out after the Germanic invasion)	500 Japan adopts Buddhism from Korea 527-565 Under Justinian Byzantine Empire reaches greatest glory 533 Justinian's general Belisarius destroys the Kingdom of the Vandals

MEDIEVAL HISTORY (continued)

A.D.	WESTERN EUROPE	BRITISH ISLES	OTHER COUNTRIES
600	<p>613. Lothair, great-grandson of Clovis, again reunites Frankish kingdom.</p> <p>628-638. Dagobert, Lothair's son, last strong Merovingian ruler of the Frankish kingdom. Under his successors, kingdom again divided into Austrasia and Neustria. mayors of the palace assume control.</p> <p>687. Pepin of Herstal makes himself mayor of both Austrasia and Neustria by victory at Tertry.</p>	<p>c. 600. Kingdom of Northumbria formed by union of Bernicia and Deira by Edwin, most powerful ruler in England.</p> <p>617. Edwin builds Dunedin (Edinburgh).</p> <p>633. Edwin defeated and killed by Penda, heathen king of Mercia.</p> <p>635. Aidan, a monk of Iona, founds Lindisfarne; brings Christianity once more to Northumbria.</p> <p>664. Synod of Whitby settles adherence of English church to Rome.</p> <p>669-690. Theodore of Tarsus, a Greek, archbishop of Canterbury; organizes church system in England.</p>	<p>605-610. The Grand Canal, China, made by linking older waterways.</p> <p>611-623. Chosroes II, king of Persia, struggles with, and is defeated by, Byzantium.</p> <p>622. Traditional date of Mahomet's flight (Hegira) from Mecca to Medina; founding of Mahomedan religion (Islam).</p> <p>634-703. Arabs, inspired by militant missionary creed of Islam, conquer a vast empire—Mesopotamia and Persia, Palestine and Syria, Egypt, and North Africa to Tunis; they capture Carthage and burn it to the ground, 698. End of Byzantine rule in North Africa.</p> <p>673-678. Arabs besiege Constantinople; defeated by new invention, Greek fire, and Greek destruction of Arab fleet at Syllaceum, 677.</p> <p>692. Council of Constantinople recognizes equality of patriarchates of Rome and Constantinople.</p>
700	<p>711. Arabs (or Moors) invade Spain from North Africa and overthrow kingdom of the Visigoths; reach the Pyrenees, 719.</p> <p>732. Franks, under Charles Martel, son of Pepin of Herstal, defeat Arabs at Tours and force them back into Spain, 750.</p> <p>752. Pepin the Short, son of Charles Martel, assumes the Frankish crown and founds Carolingian line.</p> <p>754. Pepin invades Italy; defeats king of Lombards; admits papal rights in central Italy (origin of Papal States), 756.</p> <p>768. Charles and Carloman divide the Frankish kingdom on death of their father Pepin the Short.</p> <p>771. Carloman dies; Charles, called the Great, or Charlemagne, becomes king of all the Franks (771-814).</p> <p>774. Charlemagne overthrows Lombard kingdom; assumes iron crown of Lombardy at Paris.</p> <p>785. Charlemagne conquers and forcibly Christianizes Saxony.</p>	<p>757-796. Offa II, king of Mercia; builds Offa's Dyke against Welsh, c. 780.</p> <p>787. First raid of Danes (or Norsemen) on England.</p> <p>795. Norse invasion of Ireland begins.</p>	<p>717-718. Second Arab siege of Constantinople; ends in Arab defeat.</p>
800	<p>800. Charlemagne crowned emperor of the West at Rome by Pope Leo III.</p> <p>843. Treaty of Verdun, by which three grandsons of Charlemagne divide his empire: Louis the German becomes king of the East Franks (Tentonic in blood and speech—origin of modern Germany), Charles the Bald king of the West Franks (Romance speaking—origin of modern France); Lothair king of a middle kingdom called Lotharingia and embracing most of modern Netherlands, Belgium, Alsace and Lorraine, Switzerland, N. Italy.</p> <p>c. 870. Danes, or Northmen, begin to raid kingdom of West Franks.</p>	<p>827. England united under Egbert.</p> <p>843. Kenneth MacAlpin unites Scots and Picts under one king of Scots.</p> <p>c. 850. Olaf the White founds a Norse kingdom about Dublin; later Norse invaders found Waterford, Limerick, Wexford, and Cork.</p> <p>896. Danes begin to overrun Northumbria and East Anglia.</p> <p>871-901. Alfred the Great (born 849) king of England.</p> <p>878. Alfred defeats Danes at Ethandun; by treaty of Wedmore, divides England with Danes, keeping Wessex, Sussex, Kent, London, western half of Mercia; Danes given East Anglia, eastern half of Mercia, Northumbria as far as Tees (Danish area henceforth called Danelaw).</p>	<p>860. Rurik the Varangian (or Scandinavian) becomes first king of peoples of the Russian plain.</p> <p>867-885. Mission of Cyril and Methodius to the Slavs; they invent Slav alphabet.</p> <p>869. Council of Constantinople at which Constantinople rejects primacy of Patriarch of Rome; results in division of Church into Western (Roman Catholic) and Eastern (Greek Orthodox) sections.</p>
900	<p>911. Rollo, or Hrolf, the Ganger, leader of the Northmen, granted land (later called Normandy) for which he does homage to Charles the Simple.</p> <p>911. Death of Louis the Child, last Carolingian king of East Franks.</p> <p>919-936. Henry the Fowler, first Saxon king of the East Franks.</p> <p>936-973. Otto I, the Great, king of the East Franks; crowned emperor of the West, 962, by the Pope.</p> <p>967. Hugh Capet, first of the Capetian house, elected king of the West Franks.</p>	<p>901-925. Edward the Elder, son of Alfred, makes himself master of all southern and central England to the Humber.</p> <p>925-940. Athelstan, son of Edward, defeats Scots, Welsh, and Danes, 926, at Brunanburh.</p> <p>946-955. Edred subdues Danes of Northumbria, 954; gives up to Scottish king land called Lothian (from Cheviots to the Forth).</p> <p>978-1016. Ethelred the Redeless or Unready (that is, devoid of counsel, mistranslated Unready) buys off new Danish invaders, 991, with money raised by a new tax called Danegeld (Dane-money).</p>	<p>969. Egypt independent under Fatimid dynasty.</p> <p>988. Christianity introduced into Russia from Constantinople.</p>

MEDIEVAL HISTORY (continued)

A.D.	WESTERN EUROPE	BRITISH ISLES	OTHER COUNTRIES
1000	<p>c 1001 Cities of Italy begin to develop into independent states</p> <p>1016 Norman pilgrims and freebooters cross Alps into Italy seize Avversa c 1020 and push southwards</p> <p>1037 Ferdinand I of Castile conquers Leon and Portugal</p> <p>1072-91 Normans conquer Sicily</p> <p>1076 Aragon annexes Navarre</p> <p>1096-99 First Crusade, led by Peter the Hermit, Godfrey of Bouillon, Raymond of Toulouse, Bohemund of Otranto, object to free Palestine (the Holy Land) from Islam</p>	<p>1002 Danish settler massacred, Swain king of the Danes makes himself master of the Danelaw and of western Mercia and Wessex</p> <p>1002 Brian Boru (born 926) becomes chief king of Ireland, killed in his tent after decisive defeat of Danes by his forces at Clontarf, 1014</p> <p>1016-1042 Danish kings rule England</p> <p>Canute, 1016-35, divides England into four earldoms (from Danish jail) Wessex under Godwin, Mercia under Leofwine (both Englishmen), Northumbria and East Anglia. His sons Harold I 1035-40 and Hardicanute 1040-42 ended Danish line</p> <p>1042-1066 Edward the Confessor, second son of Ethelred king of England dies childless</p> <p>1066 Norman Conquest of England. William Duke of Normandy makes good his shadowy claim to English throne by defeating and killing Harold II, Godwin's son at the Battle of Hastings</p> <p>1066-1087 William I, the Conqueror, king of England and Duke of Normandy</p> <p>1072 Malcolin (unmore) king of Scots (1059-1093) compelled to do homage to William the Conqueror</p> <p>1085-86 Domesday Book drawn up</p>	<p>1001 Mahmud of Ghazni invades India, annexes Punjab</p> <p>1020 Persia and Mesopotamia within Empire of Seljuk Turks</p> <p>1099 Sack of Jerusalem in First Crusade. Christian kingdom of Jerusalem set up with Godfrey of Bouillon as king</p>
1100	<p>1130 Count Roger II of Sicily assumes title of king of Sicily, Apulia and Capua</p> <p>1137 Catalonia and Aragon united</p> <p>1143 Independence of Portugal recognized</p> <p>1147-49 Second Crusade accomplishes nothing</p> <p>1152-1190 Frederick I, Barbarossa (red beard) Emperor begins use of style Holy Roman Empire</p> <p>1189-92 Third Crusade, led by Emperor Frederick Barbarossa, Richard I of England, Philip II of France. Accomplishes nothing</p> <p>c 1190 Crusading order of Teutonic Knights founded</p>	<p>1100 Charter of Liberties printed to England by Henry I 1100-35</p> <p>1154-1189 Henry II first Plantagenet king of England</p> <p>1171 Henry II of England forces Ireland to acknowledge his sovereignty</p> <p>1175 William the Lion of Scotland captured 1174 by the English pays allegiance to Henry II</p> <p>1192-94 Richard I Coeur de Lion king of England 1189-99 captive of the Emperor Henry VI</p>	<p>1171-93 Saladin, vizier of last Fatimid ruler gains control of Egypt 1171 conquers Damascus 1173 seizes Mesopotamia</p> <p>1185-86 takes Jerusalem 1187, without a sack defends his conquests against Third Crusade 1189-92</p> <p>1176-1206 Mohammed of Ghor adds the Ganges basin to Indian possessions of Ghazni</p>
1200	<p>1200-04 Fourth Crusade brings discredit on papacy by looting of sack of Constantinople</p> <p>1211-50 Frederick II Stupor Mundi (wonder of the world) Emperor from 1220</p> <p>1218-21 Fifth Crusade ends in failure</p> <p>1227-29 Sixth Crusade led by Emperor Frederick II, Pope Gregory IX, excommunicates him 1227-1229</p> <p>1248-54 Seventh Crusade, led by Louis IX of France, who was captured 1249, ran some 1251</p> <p>1270-72 Eighth Crusade, led by Louis IX of France (died of plague while besieging Tunis 1270, canonised 1297) and Edward (afterwards Edward I) of England. Accomplishes nothing</p> <p>1277 Archbishop Otto Visconti establishes Visconti rule in Milan</p>	<p>1201 French territories of the King of England lost except Channel Islands and part of Aquitaine</p> <p>1215 Barons force King John of England (1199-1216) to grant Great Charter (Magna Carta), lists in which developed unwritten constitution of Britain</p> <p>c 1240 Great Council of England begins to be called Parliament</p> <p>1276-84 Edward I of England (1272-1307) conquers Wales</p> <p>1290 Death of Margaret the Maid of Norway, the first heir to Scottish crown</p> <p>1292 Edward I of England awards Scottish crown to John Balliol one of 13 claimants who does homage to Edward for his kingdom</p> <p>1295 Scottish alliance with France starts</p> <p>1296-1304 Edward I of England conquers Scotland</p>	<p>1204 Crusaders (4th Crusade) storm and sack Constantinople</p> <p>1206-23 Tartars or Mongols, led by Jenghiz Khan sweep through central Asia, capture Bokhara 1219, Samarkand 1220, invade Russia, then retire to Asia</p> <p>1220 Emperor Frederick II crowns himself king of Jerusalem in church of Holy Sepulchre</p> <p>1229-83 Teutonic Knights undertake Christianisation of Prussia</p> <p>1277-41 Tartars under Batu Khan invade Russia, Poland, Hungary, defeat Poles and Germans at Tlegbitz, overrun Bulgaria, Wallachia, Moldavia 1241 settle on lower Volga</p> <p>1244 Muslims take Jerusalem</p> <p>1258 Tartars sack Baghdad</p> <p>1260 Mamluks defeat Tartars check their advance into Egypt</p> <p>1261 Byzantine Emperor Michael VIII retakes Constantinople</p> <p>1290-1326 Ottoman I founds Ottoman dynasty, extends Turkish territory at expense of Byzantium</p>
1300	<p>1305-77 Popes remove to Avignon. Italy in state of anarchy</p> <p>1334 Term Hansa League first appears in a document</p> <p>1337 Hundred Years' War between France and England begins</p> <p>1347-50 The Black Death reduces population of W. Europe perhaps by a third</p> <p>1378-1417 The Great Schism: two popes, one at Rome, one at Avignon, and from 1409-15 a third at Pisa</p> <p>1386 Treaty of Windsor makes permanent alliance between England and Portugal</p>	<p>1314 Robert Bruce (grandson of another 1292 claimant to the Scots crown) defeats the English at Bannockburn, becomes king Robert I of Scotland, 1314-29</p> <p>1323 Robert Bruce's title recognized by Edward III of England</p> <p>1337 Hundred Years' War with France begins. English win at Crécy 1346, Poitiers 1356, capture Calais 1347</p> <p>1348-49 Black Death reduces population of England perhaps by half</p> <p>1363 English, instead of Norman French, first used in English law courts</p> <p>1367 Parliament representing English settlers established in Ireland</p> <p>1371 Stuart line begins with accession of Robert II, 1371-80, grandson of Robert I</p> <p>1381 John Wycliffe challenges doctrine of transubstantiation, beginning of Reformation in England</p>	<p>1354 First Turkish settlement in Europe, at Gallipoli</p> <p>1365 Turks capture Adrianople and make it their capital</p> <p>1368 Ming dynasty established in China</p> <p>1380 Princes of Moscow begin struggle for Russian independence</p> <p>1380-93 Tartars led by Tamerlane of Samarkand seize Afghanistan, reconquer Persia and Mesopotamia</p> <p>1385 Poland and Lithuania unite, oppose Teutonic Order</p> <p>1385 Turks capture Sofia</p> <p>1396 Turks capture Nash</p> <p>1398-99 Tamerlane invades India, sacks Delhi and Meerut, then retreats</p>

MEDIEVAL HISTORY - MODERN HISTORY

A.D.	WESTERN EUROPE	BRITISH ISLES	OTHER COUNTRIES
1400	<p>1402-47 Filippo Maria Visconti, last Visconti ruler of Milan</p> <p>1414-17 Council of Constance ends the Great Schism, elects Pope Martin V</p> <p>1415. Battle of Agincourt. Henry V of England reconquers Normandy</p> <p>1422 Henry VI of England recognized as king of France to the north</p> <p>1429 Joan of Arc relieves Orléans. Charles VII crowned king of France there</p> <p>1438 Albert V, king of Hungary and Bohemia, becomes Emperor Albert II of Holy Roman Empire, title henceforth (except 1740-45) hereditary in Hapsburg family until it disappears, 1806</p> <p>c 1440 Invention of printing in Europe</p> <p>1444 Cosimo de Medici becomes Despot of Florence and begins Medici domination of that city. His patronage of the arts makes Florence centre of the Renaissance</p> <p>1452 Last coronation of Holy Roman Emperor in Rome (Frederick III)</p> <p>1453 End of Hundred Years' War. English driven out of all France except Calais</p>	<p>1415 Henry V of England (1413-1422) wins battle of Agincourt</p> <p>1420 English defeated at Orléans.</p> <p>1453 Calais only remaining English possession in France, end of Hundred Years War</p>	<p>1410 Total defeat of Teutonic Order at Tannenberg by Polish-Lithuanian armies</p> <p>1453 Turks capture Constantinople. End of Byzantine Empire</p>
MODERN	WESTERN EUROPE	BRITISH ISLES	OTHER COUNTRIES
1470-1510	<p>Ferdinand II king of Aragon and Castile united through the marriage, in 1469, of Isabella of Castile (succeeded 1474) and Ferdinand</p> <p>1492 Granada taken from Moors, Moors expelled from Spain.</p> <p>1492-1503 Rodrigo Borgia pope as Alexander VI</p> <p>1494-95 Invasion of Italy by Charles VIII of France who took Florence, Pisa, Rome, Naples, whence he was forced to retreat northward</p>	<p>1455-85 Wars of the Roses in England end with accession of Henry VII, first of the Tudors</p> <p>1495 Poyning's Laws or Statutes of Drogheda place Irish Parliament under control of king of England</p> <p>1497 John Cabot sails from Bristol, discovers Newfoundland</p>	<p>1496 Poland aiding Prussian revolt secures West Prussia. Teutonic knights restricted to East Prussia, cut off from Germany</p> <p>1488 Bartholomew Diaz rounds Cape of Good Hope</p> <p>1492 Christopher Columbus reaches the New World</p> <p>1412 Ivan III, the Great makes Moscow centre of government of Muscovy (Russia)</p> <p>1498 Vasco da Gama anchors off Calicut, India</p> <p>1499 Native dynasty found in Shah Ismail, replaces Timurid in Persia</p>
1500	<p>1517 Luther nails his 95 theses on door of church at Wittenberg beginning of Reformation in Germany</p> <p>1527 Sack of Rome by troops of Emperor Charles V</p> <p>1530 Charles V crowned by the Pope as Emperor and king of Italy</p> <p>1534 Loyola founds Jesuit order, approved by Pope Paul III 1540</p> <p>1541 John Calvin leads Reformation in Geneva</p> <p>1549 First Papal Index of forbidden books drawn up</p> <p>1559 Treaty of Cateau Cambresis gives Lombardy, Naples Sicily to Spain</p> <p>1562-98 Religious wars in France; the Massacre of St Bartholomew 1572 Edict of Nantes 1598 gives Huguenots (Protestants) equal rights with Catholics in France</p> <p>1568. Revolt in the Netherlands against Philip II of Spain</p>	<p>1502 James IV of Scotland marries Margaret Tudor, daughter of Henry VII of England</p> <p>1503-47 Henry VIII King of England</p> <p>1513 James IV invades England, killed at Flodden Field</p> <p>1534 Henry VIII proclaims himself head of the Church of England</p> <p>1536-39 Suppression of the Monasteries in England (lessor 1536, greater 1539)</p> <p>1541 Henry VIII assumes title King of Ireland</p> <p>1558 Calais, last English possession in France lost.</p> <p>1558-1603 Elizabeth I queen of England and Ireland</p> <p>1588 Spanish Armada defeated off coasts of England Scotland and Ireland</p>	<p>1496 Poland aiding Prussian revolt secures West Prussia. Teutonic knights restricted to East Prussia, cut off from Germany</p> <p>1488 Bartholomew Diaz rounds Cape of Good Hope</p> <p>1492 Christopher Columbus reaches the New World</p> <p>1412 Ivan III, the Great makes Moscow centre of government of Muscovy (Russia)</p> <p>1498 Vasco da Gama anchors off Calicut, India</p> <p>1499 Native dynasty found in Shah Ismail, replaces Timurid in Persia</p> <p>1516 Turks conquer Syria</p> <p>1517 Turks conquer Egypt</p> <p>1519-22 Magellan circumnavigates the globe</p> <p>1521 Turks take Belgrade</p> <p>1526 Turks defeat and kill Louis II king of Hungary at Mohacs</p> <p>1520 Babur the Mongol (or Mogul) crosses the Himalayas and conquers northern India</p> <p>1529 Turks lay siege to Vienna but withdraw</p> <p>1547 Turks conquer Mesopotamia</p> <p>1547 The Portuguese sail as first Europeans to visit Japan</p> <p>1547 Ivan IV, the Terrible crowned as first Tsar of Russia rules 1547-54</p> <p>1549 Francis Xavier begins his mission in Japan</p> <p>1556-1605 Akbar conquers all Hindustan and founds Mogul Empire</p> <p>1571 Turks defeated in naval battle of Lepanto</p> <p>1586-1628 Golden Age in Persia under Shah Abbas</p>
1600	<p>1618-48. Thirty Years' War, ended by Treaty of Munster (also called of Westphalia) which among its provisions recognized independence of the United Provinces (modern kingdom of the Netherlands) and Switzerland</p> <p>1643-1715. Louis XIV king of France (Le Roi Soleil, the sun king)</p> <p>1689 Last assembly of Hanseatic League</p> <p>1685. Revocation of Edict of Nantes. reformed religion forbidden in France</p>	<p>1603 Crowns of England and Scotland are united in person of James Stuart, VI of Scotland (from 1567) I of England 1603</p> <p>1610 (colonisation) (or Plantation) of Ulster by English and Scottish settlers</p> <p>1625-49. Charles I king, executed by victorious Parliamentarians</p> <p>1643-48 Civil War.</p> <p>1649-60 The Commonwealth</p> <p>1680-85 Charles II king</p> <p>1688. "The Glorious Revolution": James II (died 1701) abdicates</p> <p>1689-1702 William III and Mary II (died 1694)</p> <p>1690 William III defeats James II at the Battle of the Boyne</p> <p>1694 Bank of England founded</p>	<p>1613 Michael Romanov elected Tsar of Russia, first of dynasty that lasted until 1917</p> <p>1614 All foreign priests expelled from Japan</p> <p>1644 Last Ming emperor of China hangs himself. Manchu dynasty established (rules until 1912)</p> <p>1692-1725 Peter the Great Tsar of Russia</p> <p>1693 Turks again besiege Vienna driven off by German and Polish army</p>

MODERN HISTORY (continued)

A.D.	FRANCE	GERMANY, AUSTRIA, ETC.	ITALY AND PAPACY	GREAT BRITAIN	OTHER COUNTRIES
1700	1702 13 War of the Spanish Succession. Treaty of Utrecht sets French prince (Philip V) on Spanish throne.	1701 Elector of Brandenburg crowns himself King of Prussia.		1702 13 Louis XIV takes part in War of Spanish Succession (Blenheim, 1704).	1703 Peter the Great founds St. Petersburg (now Leningrad) capital of Russia.
	1715 74 Louis XV. Treaty of Fontenoy. France and Prussia in Austrian Succession War.	1713 40 Frederick William I develops Prussian army.	1713 Milan Naples etc. given to Austria by Treaty of Utrecht.	1702 14 Anne.	1709 Battle of Poltava forces of Charles XII of Sweden subdued by Russia.
	1756 63 Seven Years' War. France and Austria against Prussia loses Canada and India to British.	1740 86 Maria Theresa queen of Bohemia and Hungary, archduchess of Austria, War of Austrian Succession (1740-48).	1738 Spanish Bourbons established in Naples. Louis XV given to France of Lorraine (husband of Maria Theresa).	1707 English and Scottish parliaments are united.	1714 Lurks drive Venetians from the Morea.
	1774 92 Louis XVI (Marie Antoinette of Austria queen).	1740 86 Frederick II (The Great) of Prussia seizes Silesia from Austria and retains it in Seven Years' War (Battles of Rossbach and Muhlten, 1757) builds up Prussia in peace time.	1796 Napoleon Bonaparte invades Italy. Siege of Mantua. Destruction of Republic of Venice.	1715 Unsuccessful rising in support of James II's son the Elder Pretender.	1732 47 Nadir Shah robber chief seizes throne of Persia first of Zerd dynasty.
	1789 95 French Revolution. States General becomes National Assembly (1790) constitution accepted by king (1791) kingship abolished and Republic proclaimed (1792).	1760 90 Joseph II attempts reforms in Hapsburg lands.	1797 Castlereagh Republic (unitary) set up by Bonaparte.	1745 "Bonnie Prince Charlie" leads unsuccessful Stuart rising.	1782 96 Catherine II empress of Russia.
	Louis XVII executed (1793), Reign of Terror (1793-94), Directory (1795).	1790 92 Leopold II.	1799 All Italian mainland (except Venice) under French rule.	1756 63 Seven Years' War. England and Prussia. Canada acquired. British supremacy established in India.	1772 First partition of Poland, which loses territory to Prussia, Russia and Austria.
	1795 99 Rise of Napoleon Bonaparte.	1792 France II.		1760s Industrial Revolution begins. Hargreaves invents spinning Jenny. James Watt the steam engine.	1793 Second partition of Poland, which loses more land to Prussia and to Russia.
				1783 83 Revolt of the American colonies.	1794 1925 Kajar dynasty rules Persia.

WARS OF THE FRENCH REVOLUTION AND BONAPARTE: 1792-1815

1793 Bonaparte Italian Campaign.	1807 Napoleon defeats Russians at Friedland.	1809 Napoleon defeats Austrians at Wagram.
1798 Egyptian expedition fails (Battle of the Nile).	1807 Peace of Tilsit. Hard terms for Prussia. Alexander I of Russia becomes Napoleon's ally.	1812 Napoleon invades Russia, sack of Moscow. Disastrous retreat.
1800 Napoleon's victory at Marengo.	1808 14 Peninsular War, fought by Britain, Spain and Portugal against France. Napoleon himself was in Spain only in 1808.	1813 Napoleon defeated in three day battle at Leipzig.
1805 Napoleon's victory at Austerlitz.		1815 Wellington's victory at Waterloo.
1806 Treaty of Tilsit at Jena.		1815 Congress of Vienna (1814-15) ends European settlement.

THE BRITISH EMPIRE TO 1783

1600 East India Company chartered by Queen Elizabeth I.	1663 Charter for Carolina granted to Lord Clarendon and others.	1751 Capture of Arcot by Clive.
1604 Port Royal (Annapolis, Md.) N.A.S.'s oldest European settlement in America north of Florida, founded by French.	1663 Charter of the company of One Hundred Associates revoked. New France becomes a royal province.	1754 French expelled from Nova Scotia.
1607 Jamestown (Virginia) founded by English colonists.	1664 New Jersey granted to Lord Berkeley and Sir George Carteret. New Amsterdam captured by English fleet, becomes New York.	1666 Wolfe captures Quebec (1759).
1608 Quebec settled by French colonists (St. Louis, Champlain).	1665 Carolina divided into North Carolina and South Carolina.	New France ceded to England by Peace of Paris (1763).
1610 Hudson discovers Hudson Bay while searching for the Northwest Passage. England claims Hudson Bay.	1670 Hudson's Bay Company founded in England to carry on trade in territory around Hudson Bay.	1766 Black Hole of Calcutta.
1612 Jahangir sanctions first English trading centre in India, at Surat.	1672 Frontenac becomes governor of Canada.	1767 Clive wins battle of Plassey.
1615 Champlain explores Lake Erie.	1673 Marquette and Joliet discover the Mississippi.	1767 Bihar, Bengal, and Orissa ceded to the East India Company.
1619 Virginia has first democratic legislature (House of Burgesses) in North America. First Negro slaves introduced into Virginia.	1679 New Hampshire separated from Massachusetts.	1765 Stamp Act. First stir in American colonies. Stamp Act Congress protests against taxation by home government without representation in home parliament. Act repealed 1766.
1620 Plymouth colony founded by English Puritans (Massachusetts).	1681 2 La Salle descends the Mississippi and takes the country for France, calling it Louisiana in honour of Louis XIV.	1769 Hyder Ali, usurping ruler of Mysore, attacks English.
1626 New Amsterdam founded by Dutch.	1682 William Penn founds Pennsylvania.	1770 Townshend Duty Act, 1767, repealed except for tax on tea.
1627 St. Lawrence Valley granted to Richelieu's company of "One Hundred Associates."	1689 97 War with France. Acadia captured by the British, restored at the Peace of Ryswick (1697).	1773 "Boston Tea Party". Bostonians refuse to allow taxed tea to be landed.
1634 First colonists land in Maryland.	1630 John Charnock founds Calcutta.	1773 Regulating Act gives India its first governor-general (Warren Hastings).
1635 Connecticut (Hartford, Windsor, etc.) founded.	1701 Detroit founded by French as trading post.	1774 Quebec Act reorganizes government of Canada.
1636 Rhode Island settled. Roger Williams founds Providence.	1702 13 War of the Spanish Succession. Acadia (Nova Scotia) seized ceded under the treaty of Utrecht by France, which also gave up claims to Newfoundland and Hudson's Bay Territories.	1774 Continental Congress meets at Philadelphia.
1638 Swedes settle along the Delaware.	1732 Georgia, last of the 13 American colonies to be founded, separated from South Carolina.	1775 American Revolution begins.
1640 Francis Day founded Fort St. George (later Madras).	1740 48 War of the Austrian Succession. Louisburg captured by English colonists (1745), restored to French by treaty of Aix la Chapelle.	1775 83 War of American Independence.
1642 Montreal founded by Maisonneuve as a religious colony.	1749 English settlement of Halifax founded; colonisation of Nova Scotia begins.	1776 Colonists adopt Declaration of Independence.
1643 United Colonies of New England confederacy formed.		1778 Independence of 13 colonies recognized by France.
1644 Rhode Island obtains its first charter.		1778 84 War against Hyder Ali of Mysore, and his son Tipu Sultan.
1661 Charles II received Bombay as part of the dowry of Catherine of Braganza.		1781 Cornwallis British commander besieged in Yorktown and forced to surrender to Washington.
1662 Charter granted to Connecticut.		1782 Hostilities in War of Independence cease.
		1783 Treaty of Paris. Great Britain recognizes independence of the 13 American colonies.

MODERN HISTORY

A.D.	FRANCE	GERMANY	AUSTRIA-HUNGARY	ITALY
1800	<p>1804. Napoleon made Emperor.</p> <p>1814. Napoleon abdicates : returns from Elba (1815) : exiled to St Helena (1815)</p> <p>1814-24. Bourbons restored in person of Louis XVIII.</p> <p>1824-30. Charles X king</p> <p>1830. French begin occupation of Algeria</p> <p>1830. July Revolution : Charles X abdicates ; Louis Philippe becomes king ("citizen king").</p> <p>1848. February Revolution : Louis Philippe abdicates.</p> <p>1848-52. Second Republic (Louis Napoleon president).</p> <p>1851. <i>Coup d'état</i> by Louis Napoleon : proclaimed emperor as Napoleon III (1852-70)</p> <p>1854-56. Crimean War.</p> <p>1859. War with Austria on behalf of Italy</p> <p>1861-67. Attempt to found a monarchy in Mexico fails (Maximilian).</p> <p>1870-71. Franco-Prussian War : France loses Alsace-Lorraine.</p> <p>1870. Third Republic proclaimed</p> <p>1881. Tunisia occupied.</p> <p>1894-1906. Trials of Dreyfus for treason the centre of political scandal</p> <p>1896. Annexation of Madagascar.</p>	<p>1806. Confederation of the Rhine formed by Napoleon.</p> <p>1806. Use of term Holy Roman Empire ceases.</p> <p>1819. Karlsbad Decrees passed by German Diet suppress liberalism.</p> <p>1834. German Customs Union (Zollverein) formed.</p> <p>1840-61. Frederick William IV king of Prussia.</p> <p>1848. Liberal risings in Prussia and other German states.</p> <p>1848-49. Frankfurt Parliament fails to unite Germany.</p> <p>1861-68. William I king of Prussia</p> <p>1862. Bismarck becomes chief minister.</p> <p>1864. Schleswig and Holstein seized by Prussia and Austria.</p> <p>1866. Austro-Prussian War</p> <p>1867-71. North German Confederation under Prussian leadership</p> <p>1870-71. Franco-Prussian War : siege of Metz and battle of Sedan (1870) : capture of Paris (1871).</p> <p>1871. German Empire proclaimed : William I emperor : Bismarck chancellor (1871-90).</p> <p>1882. Germany, Austria, and Italy form Triple Alliance.</p> <p>1884. Germany begins African colonisation</p> <p>1884-1918. William II emperor.</p> <p>1898. Germany seizes Kiaochow, China.</p> <p>1899. Concession from Turkey permitting construction of Berlin-Baghdad railway begins Turko-German friendship.</p>	<p>1804. Francis II takes title Emperor of Austria.</p> <p>1806. Use of term Holy Roman Empire ceases.</p> <p>1809. Metternich becomes minister of foreign affairs.</p> <p>1814-15. Congress of Vienna.</p> <p>1815. "Holy Alliance" formed by Russia, Prussia, and Austria.</p> <p>1835-48. Ferdinand I.</p> <p>1848. Revolution expels Metternich.</p> <p>1848-1916. Francis Joseph.</p> <p>1849. Hungarian fight for independence fails (Kossuth).</p> <p>1859. War with France and Italy (battles of Magenta and Solferino). Austria loses Lombardy to Sardinia.</p> <p>1866. War with Prussia (Sadowa). Austria withdraws from German Confederation, loses most of Venetia to Italy</p> <p>1867. Dual Monarchy of Austria-Hungary established, Francis Joseph taking the title of king (of Hungary) - emperor (of Austria)</p> <p>1882. Triple Alliance formed by Austria, Germany, and Italy.</p>	<p>1815. Italy again split into small states under Austrian domination.</p> <p>1820. Revolt in Naples put down.</p> <p>1821. Revolt in Piedmont fails.</p> <p>1832. Giuseppe Mazzini founded "Giovine Italia" (Young Italy) at Marselles.</p> <p>1848. Revolution headed by Sardinia - Piedmont crushed by Austria</p> <p>1849. Victor Emmanuel II becomes king of Sardinia - Piedmont. Cavour premier (1852-61).</p> <p>1859. War with Austria; Austrian control in Italy broken.</p> <p>1860. Garibaldi conquers Naples.</p> <p>1860-61. Italy (except Rome) united; kingdom of Italy proclaimed at Turin (1861).</p> <p>1870. Rome taken from Pope and made capital of Italian kingdom.</p> <p>1878-1900. Humbert I (assassinated by anarchist).</p> <p>1882. Italy enters Triple Alliance with Austria and Germany.</p> <p>1896. War with Abyssinia; Italian defeat at Adowa.</p>
1900	<p>1904. Entente Cordiale with Britain.</p> <p>1905. Separation of Church and State</p> <p>1905-06. Extension of French influence in Morocco challenged by Germany, Algeiras Conference upholds French policy</p> <p>1911. Germany sends warship "Panther" to Agadir, Morocco; France cedes territory adjacent to German Cameroons in return for recognition of its right to protect Morocco</p>	<p>1900. Naval development starts</p> <p>1905-06. First Moroccan incident.</p> <p>1908. Germany supports Austria in annexation of Bosnia and Herzegovina.</p> <p>1911. Second Moroccan incident.</p> <p>1911-13. German standing army increased from 615,000 to 866,000 men.</p> <p>1912. Socialists elect 110 of 307 members of Reichstag</p>	<p>1905-13. Internal disension in Austria-Hungary owing to differences of blood and language among the king-emperor's varied subjects.</p> <p>1908. Austria annexes Bosnia and Herzegovina (coveted by Serbia)</p> <p>1914. Archduke Francis Ferdinand, heir to Austrian throne, assassinated in Bosnia by Prinzip, an Austrian subject of Serbian blood</p> <p>Austria declares war on Serbia (July 28).</p>	<p>1900. Victor Emmanuel III becomes king.</p> <p>1911-12. War with Turkey : Italy annexes Tripolitania and Cyrenaica (Libya).</p> <p>1912. Universal manhood suffrage introduced.</p> <p>1914-15. Italy a neutral in First World War.</p>
FIRST WORLD WAR :				
1914. Aug. 1. Germany declares war on Russia, 1st World War begins, declares war on France, Aug 3	1914. Sept. 6-10. First Battle of Marne halts German invasion of France	1915. Italy denounces Triple Alliance and declares war against Austria-Hungary	1916. Germans fail to take Verdun ; first battle of the Somme.	1917. United States enters the war.
1915. Gallipoli expedition fails.				
1919. Treaty of Versailles ratified. By this and subsequent peace treaties France regains Alsace-Lorraine, and is allotted mandate over parts of Cameroons and Togo (in Africa), Syria, etc.; also economic reparations from Germany; Saar Basin is placed under French administration for 15 years, left bank of the Rhine (in Germany) demilitarised for ever.	1918. German revolution; William II abdicates.	1918. June 23. Treaty of Versailles signed (ratified July 10). Germany loses overseas colonies; Alsace-Lorraine, parts of Posen and West Prussia, etc.; armament reduced; reparations agreed to.	1918. Oct. 28. Czechoslovakia proclaims its independence.	1918. Oct. 31. Revolution in Hungary; declares its independence, Nov. 16.
	1919. "Spartacist" (extreme Socialist) revolt suppressed.	1919. Republican constitution adopted.	1918. Nov. 3. Austria signs armistice.	1918. Nov. 12. Republic of Austria proclaimed.
			1919. Treaty of St. Germain concludes peace with Allies (except U.S.A.), breaks up Austro-Hungarian Empire.	1919. Treaty of St. Germain; Italy gains S. Tirol, Trieste, and Istria from Austria.

MODERN HISTORY (continued)

GREAT BRITAIN	RUSSIA	TURKEY AND THE BALKANS	OTHER COUNTRIES AND GENERAL EVENTS
1801. Irish Parliament passed Act of Union (with Great Britain) giving Ireland representation at Westminster instead of a separate parliament. United Kingdom of Great Britain and Ireland came into being.	1801-25 Alexander I	1821-29 War for independence fought by Greeks against Turkey. Russia joins Greeks 1828-29	1807 Napoleon makes his brother Joseph king of Spain
1807. Act abolishing slave trade in British Empire passed	1808-09 War with Sweden which ceded Finland (made an autonomous grand duchy)	1829 Serbia, Moldavia and Wallachia secure autonomy (treaty of Adrianople) after long struggle against Turks	1807 Fulton's Clermont first successful steamboat, staged from New York to Albany
1812-14. War with the United States, Treaty of Ghent (1814)	1812 Napoleon invades Russia; Moscow burned; disastrous French retreat	1830 Greek independence recognized by Turkey	1812 Spanish Cortes adopted democratic constitution
1820-30 George IV	1815 War grants a constitution to Russian Poland	1833-62 Otto (of Bavaria) king of Greece	1814 Norway taken from Denmark by Bernadotte of Sweden
1827. British fleet helps to defeat Turks in Battle of Navarino	1825-55 Nicholas I	1838 Turkey declares war on Russia	1814-33 Ferdinand VII king of Spain. Constitution suppressed
1830-37 William IV	1828-29 War with Persia, which ceded part of Armenia	1854-56 Crimean War	1820 Risings in Naples and Spain crushed 1821-23
1832 Reform Act gives political power to middle classes	1828-29 War against Turkey on behalf of Greece	1854-56 Crimean War	1825 First railway line, Stockton to Darlington opened
1837-1901. Victoria	1830 Polish rising suppressed. Russian Poland made a province of Russia	1854-56 Crimean War	1830 Rebellion in South Netherlands (recognized by the Great Powers in 1839 as independent kingdom of Belgium)
1846. Repeal of corn laws, free trade established	1830 Polish rising suppressed. Russian Poland made a province of Russia	1854-56 Crimean War	1837 Wheatstone granted patent for electro-magnetic telegraph
1851 The Great Exhibition	1830 Polish rising suppressed. Russian Poland made a province of Russia	1854-56 Crimean War	1840-42 British opium war against China. China opened to foreign trade
1854-56 Crimean War against Russia (which was defeated) in defence of Turkey	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1857 Matrimonial Causes Act sets up civil court of divorce	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1857 Second Reform Act extended political power to working men	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1870 First Elementary Education Act	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1870 Home Rule movement starts in Ireland	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1872 Public Health Act	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1875 Britain buys half share in Suez Canal	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1878 Congress of Berlin. End to the treaty which ended Russo-Turkish war. Dispatch British prime minister brings back peace with honour	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1880 Employers Liability Act	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1882 Married Women's Property Act	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1887 Queen Victoria's Golden Jubilee	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1887 Queen Victoria's Diamond Jubilee	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1898-1902 South African War	1854-56 Crimean War	1854-56 Crimean War	1842 British opium war against China. China opened to foreign trade
1901-10 Edward VII. promotes Entente Cordiale with France (1904)	1904-05 Russo-Japanese War. Russia defeated	1908 Successful revolution in Turkey by Young Turks	1897 King Leopold II of the Belgians founds international association for exploration and exploitation of Africa. Then formed 1884 into the Congo Free State which became 1885 Leopold's personal property
1906 Liberal Government returns with working majority of 350	1905 Attempted Revolution suppressed	1908 Bulgaria declared its independence; recognized by Great Powers 1909	1897 King Leopold II of the Belgians founds international association for exploration and exploitation of Africa. Then formed 1884 into the Congo Free State which became 1885 Leopold's personal property
1910-36 George V	1906 First Duma (national assembly) called	1908 Austria annexes Bosnia and Herzegovina	1897 King Leopold II of the Belgians founds international association for exploration and exploitation of Africa. Then formed 1884 into the Congo Free State which became 1885 Leopold's personal property
1911 Parliament Act limits power of House of Lords	1907 Anglo-Russian agreement	1911-12 Turco-Italian War, Italy annexes Libya	1897 King Leopold II of the Belgians founds international association for exploration and exploitation of Africa. Then formed 1884 into the Congo Free State which became 1885 Leopold's personal property
1914 Irish Home Rule Act passed and suspended		1912-13 Balkan Wars, Balkan alliance conquers all Turkey in Europe except part of Thrace	1897 King Leopold II of the Belgians founds international association for exploration and exploitation of Africa. Then formed 1884 into the Congo Free State which became 1885 Leopold's personal property
1914 Act passed for disestablishing Anglican Church in Wales suspended			1897 King Leopold II of the Belgians founds international association for exploration and exploitation of Africa. Then formed 1884 into the Congo Free State which became 1885 Leopold's personal property
1914. U.K. declares war on Germany (Aug. 4).			1897 King Leopold II of the Belgians founds international association for exploration and exploitation of Africa. Then formed 1884 into the Congo Free State which became 1885 Leopold's personal property

OF 1914-1918

1917 Jerusalem captured by the British	1917 March Revolution, Nicholas II abdicates March 15 (murdered with all his family July 10, 1918). Kerensky becomes premier	1917 Greece joins Allies following deposition of pro-German Constantine (King 1913-17)	1918. Polish Republic proclaimed (recognized 1919 by the Treaty of Versailles).
1918 Russia (March 3) and Rumania (May 6) make peace with Central Powers	1917 "October" Revolution (Oct. 25 O.S., Nov. 7 N.S.) Lenin overthrows Kerensky and sets up Bolshevik government.	1918 Proclamation of the kingdom of Serbs, Croats and Slovenes (renamed Yugoslavia 1931) formed from Serbia and Montenegro with Bosnia and Herzegovina, and other parts of the former Austro-Hungarian Empire	
1918 March 21-July 18 German drive in the West fails			
1918 July 18-Nov. 11 Allied counter-offensive Hindenburg			
1918 Easter Rebellion of Sinn Féin in Ireland crushed, Sir Roger Casement executed			
1918 Suffrage extended to women over 30			
1918 Labour party secures 75 seats in Parliament at general elections			

MODERN HISTORY (continued)

FRANCE	GERMANY AND CENTRAL EUROPE	ITALY	POLAND
1923-25 French troops occupy the Ruhr	1920 Treaty of Grand Trianon concludes peace between Allies and Hungary. Admiral Horthy regent (1920-44) of Hungary kingdom without a king.	1922 Fascist revolution; Mussolini becomes dictator of Italy.	1920 Curzon Line (drawn 1919 by territorial commission of the Versailles peace conference on basis of geographical distribution of Polish White Russian etc people) confirmed at Spa as eastern frontier.
1925 Treaty of mutual assistance with Poland.	1920 Czechoslovakia adopts republican constitution.	1929 Lateran Treaty between the Italian government and the Vatican creates the Vatican City State under papal sovereignty.	1920 Poland attacks Russia, advances to Kiev far east of Curzon line. Russian drive Poles back in Warsaw.
1925 Treaty of Locarno give five power guarantee of Franco-German frontier.	1921 U.S. treaties of peace with Germany and Austria.	1935-36 Conquest of Abyssinia.	1921 Treaty of Riga between Poland and Russia recognizes about 44,000 square miles of territory east of the Curzon line as in Poland.
1928 Building of Maginot Line started.	1924 Dawes Plan for recovery of reparations from Germany.	1936 Rome-Berlin Axis formed.	1925 Treaty of mutual assistance with France.
1932 Doumer, President of France, murdered.	1925 Germany admitted to League of Nations.	1937 Italy leaves the League of Nations.	1935 Non aggression pact with Germany.
1934 Stavisky Riots follow sale of fraudulent bonds of a face value of 46,000,000 by a naturalised Frenchman (formerly Russian) Serge Stavisky (1866-1934) (Stavisky committed suicide).	1929 Young Plan (reducing Germany's annual reparations payments) superseded by Dawes plan.	1938 Munich meeting between Hitler and British and French prime minister.	1935 Poland demands cessation of German aid to Czechoslovakia.
1934 King Alexander of Yugoslavia and the French foreign minister Louis Barthou assassinated in Marseille by a Croat.	1931 Hoover Moratorium suspends German reparations payments (never resumed).	1939 Italy seizes Albania (April).	1939 Germany denounces non aggression pact of 1934.
1935 Saar Basin returned to Germany after plebiscite.	1933 National Socialist (Nazi) party, led by Hitler, seizes power in Germany.	1939-40 Italy remains neutral until June 10, 1940 when it declares war on Britain and France.	1939 Poland occupied by Germany and Russia.
1938 France a party to Munich Agreement.	1935 Germany leaves the League of Nations.	1941 Fall of Mussolini (July 25) he was shot April 28 1945.	1941 All Poland occupied by Germany.
1939 France declared war on Germany (September 3).	1936 Germany occupies left bank of Rhine. Berlin-Rome Axis formed. Anti-Comintern Pact with Japan.	1943 Armistice with Allies (September 8).	
1940 44 North and west France, then from 1942 all France occupied by the Germans.	1938 Germany occupies Austria (March) secures northern border of Czechoslovakia under Munich Agreement (September).		
	1939 Germany occupies Czechoslovakia and annexes Memel (March) invades Poland (September 1).		
	1940 Hungary joins the Rome-Berlin Axis.		

SECOND WORLD WAR

1939 Germany invades west Poland. Russia occupies east Poland.	1941 Germany invades Russia (June). Japan attacks the USA (Dec).	1940 Victor Emmanuel III abdicates, his son Umberto II succeeds.	1945 Poland revived. Germany east of the Curzon line and (West) N. S. placed under Polish administration.
1939 Great Britain and France declare war on Germany.	1942 Battle of Alamein (N. Africa) and 1942-43 Stalingrad (Russia) turning point of war in the West.	1946 Referendum by which monarchy Italy becomes a republic.	1946-47 German inhabitants expelled from Polish occupied East Germany.
1940 Germany overruns Denmark and Norway. Belgium, Luxembourg, the Netherlands and northern France. Italy declares war on Great Britain and France, evacuation of British forces from Dunkirk. Franco-German armistice.		1947 Peace treaty with the Allies. Italy loses Trieste (to become a free zone). Istria and most of Venezia Giulia, Zadar (Zara) and several Dalmatian islands (to Yugoslavia) four small areas in the Maritime Alps (to France), the Dodecanese (to Greece). Independence of Albania and Abyssinia recognized. title to Libya, Eritrea and (Italian) Somaliland renounced.	1947 Communists gain control of government.
1945 Provisional French government set up in Paris.		1949 Federal German Republic proclaimed (May) in western (British, U.S., and French) zones, capital Bonn. German Democratic Republic proclaimed (October) in eastern (Russian) zone, capital East (Russian occupied) Berlin.	1949 Rokossovsky, former Russian commander appointed minister of defence in Poland.
1946 Constitution of Fourth Republic introduced.		1954 Cease fire in war between France and Vietnam.	
1946 Bank of France nationalised. Gas and Electricity Industries and Coal Mines nationalised.			
1949 France a party to the North Atlantic Treaty.			
	1955 West Germany a sovereign state, freed of occupation.		
	1955 Austria evacuated by Allied forces and declared a sovereign and neutral state.		

MODERN HISTORY (continued)

GREAT BRITAIN	RUSSIA	TURKEY AND THE BALKANS	OTHER COUNTRIES AND GENERAL EVENTS
1920. Government of Ireland Act passed (dividing Ireland). King George V opens Northern Ireland parliament May 1921	1918 Russia recognizes independence of Finland	1920 Office of Sultan abolished in Turkey	1919 Brown and Alcock fly the Atlantic
1921 Treaty with Southern Ireland, Dec 1921, which accepts dominion status as the Irish Free State	1918 Treaty of Brest-Litovsk (March 3) making peace between Russia and Germany	1921 Independence of Albania recognized by Allies	1920 League of Nations, created by Treaty of Versailles comes into being
1924 First Labour (minority) government	1920 Civil War Russia recognizes independence of Estonia, Latvia and Lithuania	1923 Treaty of Lausanne making peace between Allies and Turkey ratified 1924	1922 British Broadcasting Company (later Corporation) begins to broadcast regular wireless programmes. Independence of Egypt subject to certain reservations recognized by Britain
1926 General strike	1923 Union of Soviet Socialist Republics formed	1923 Turkey becomes a republic. Mustafa Kemal first president	1929 Kellogg Pact by which 23 nations including U.S.A. renounce war as an instrument of national policy
1928 Universal suffrage for men and women at 21	1924 Death of Lenin, Stalin becomes dictator	1924 Greece proclaimed a republic	1929 Bank of International Settlements created at Basle Switzerland, under the Young Plan
1931 End of free trade gold standard abandoned	1928 First Five Year Plan started	1934 All Turks compelled to take surnames, Mustafa Kemal takes the name Ataturk (father of the Turks)	1931 Revolution in Spain
1931 Statute of Westminster sets out record equal status of Dominions and Mother Country	1934 Russia admitted to membership of the League of Nations	1934 King Alexander of Yugoslavia assassinated in Marseille, Jovan P. Pet II (1934-43) succeeds	1911 Japan occupies Manchuria
1936 Edward VIII	1936 New constitution, providing direct election to the Supreme Council of the U.S.S.R.	1935 King George II of the H. lines restored to throne	1933 Japan resigns from the League of Nations
1936 George VI	1933 Non aggression pact with Germany	1935 Kemal Ataturk dies	1936 Japan and Germany make Anti-Comintern Pact
1938 Munich Agreement brought about by the Prime Minister Neville Chamberlain	1933-40 War against Finland which ceded territory covering Leningrad	1939 Italy conquers Albania	1936-39 Civil War in Spain. General Franco becomes dictator
1939 Pact of military assistance with Poland (April)	1940 Estonia, Latvia and Lithuania compelled to enter union of Soviet Socialist Republics	1940 Italians invade Greece. Rumania joins Rome Berlin Axis	1937 "China Incident" begins. Japan attacks China with out declaration of war
	1941 German invasion of Russia (June 22). Russian government moves to Kambishy (October)	1941 Bulgaria joins Rome Berlin Axis. Germans overrun Yugoslavia, Greece, and Crete	1943 League of Nations declares Russia no longer a member

AND AFTER—1939-1956

1942 American retreat from Philippine Islands. British retreat from Burma. U.S. forces land in Guadalcanal. Australians drive Japanese out of Papua. Turning point of war in P.C.I.	1945 Western Allies cross the Rhine. Allies from West and East meet at Torgau on the Elbe. Unconditional surrender of Germany until 11.00 B.M. on 8.00.16 May 9. Two atomic bombs dropped on Japan. Unconditional surrender of Japan, August 14.	1944-45 Greece, Yugoslavia and Albania liberated	1945 United Nations charter signed by 50 nations at San Francisco (June 26)
1943 Allies drive Axis forces from North Africa invade Sicily and Italy. Italy surrenders unconditionally	For full chronology of Second World War, see World Wars in Part I	1945 Yugoslavia becomes a republic	1946 First meeting of the United Nations General Assembly (in London)
1944 Allies land in France (north and later south). Paris liberated. Americans land in the Philippine Islands. Russians invade East Prussia		1945-49 Civil War in Greece	1948 State of Israel proclaimed in Palestine
1945-50 First Labour government to have majority (1950) in Parliament		1946 George II of Greece restored (died 1947) succeeded by Father Paul	1949 President Truman announces that Russia has exploded an atomic bomb
1946 Bank of England nationalised	1946 Fourth Five Year Plan started	1947 Peace treaties between Rumania and Bulgaria and the Allies	1949 Communist Government of China in control of all mainland, recognized by Britain 1950
1947 Coal Mines nationalised		1952 Greece and Turkey associated with the North Atlantic Treaty Organization	1950-53 War between North Korea (aided by Communist China) and South Korea (supported by United Nations)
1948 Railways and Canals and Electricity industry nationalised. National Health Service inaugurated		1955 Baghdad Pact signed by Iraq, Turkey, Britain, Pakistan and Persia	1952 Allies (except Russia) make peace with Japan (Treaty of San Francisco)
1949 North Atlantic Treaty (with Canada, U.S.A. and Western Europe) signed			1954 Geneva agreements end Franco-Vietminh war
1949 Gas Industry nationalised	1953 Death of Stalin, succeeded by Malenkov		1955 Four-power conference at Geneva (Britain, France, U.S.S.R., U.S.A.)
1950 First election at which every voter had one vote only	1955 Resignation of Malenkov succeeded by Bulganin		
1951 Festival of Britain			
1952 Accession of Queen Elizabeth II			
1953 All rationing ended			

BRITISH EMPIRE AND COMMONWEALTH FROM 1783

1783. First Colonial Empire in North America ended by Treaty of Paris	1868 Ottawa chosen by Queen Victoria as capital of Canada	1948 Burma becomes an independent republic
1788 First British settlement in New South Wales; Sydney founded	1850 Queensland separated from New South Wales	1948 Ceylon becomes a self-governing dominion
1790-92 Second Mysore War. Tippeco cedes part of Mysore to the East India Company	1867 British North America Act set up self governing Dominion of Canada (confederation at first of Ontario, Quebec, Nova Scotia, New Brunswick)	1949 Newfoundland admitted to federation of Canada
1791 Constitutional Act created Lower Canada (chiefly French) and Upper Canada (chiefly British)	1869 Hudson's Bay Territories ceded to Canada	1949 Irish Free State becomes republic outside the Commonwealth, but in special relations with Britain
1795 Cape Town and Dutch settlements in Ceylon occupied	1870 Red River rebellion led by Louis Riel a French Indian half breed	1950 India becomes a republic within the Commonwealth
1797 Trinidad, West Indies occupied	Manitoba formed into new province of Canada	1952 Elizabeth II proclaimed as Queen and Head of the Commonwealth in London Ottawa Canberra Wellington Pretoria Colombo and Karachi
1799 Tippeco defeated at Seringapatam and slain former Hindu dynasty restored in Mysore	1871 British Columbia joins Canada	1953 Pakistan Constituent Assembly proposes country should become Islamic Republic of Pakistan
1802 British possession of Ceylon settlements and Trinidad confirmed by treaty of Amiens	1873 Prince Edward Island becomes 7th province of Canada	1953 Federation of the Rhodesias and Nyasaland formed
1811-12 Earl of Selkirk founds settlement in Red River Valley (Canada)	1877 Queen Victoria proclaimed Empress of India	1954 British forces withdrawn from Suez Canal zone
1814 Dutch ceded Cape Town to Britain for £6,000,000	1885 Louis Riel after leading new insurrection of Canadian Indians executed	1954 Nigeria becomes a self governing federation
1815 British suzerainty over all Ceylon accepted by island rulers	1886 Canadian Pacific Railway finished, first train ran from Montreal to Vancouver B.C. 1886	
1824-26 First Burma War	1896 Burma becomes a province of British India	
1835 Melbourne founded	1887 First meeting of Colonial Conference (which developed into the Imperial and then the Commonwealth Conference)	
1836 South Australia founded	1899-1902 South African War, Transvaal and Orange Free State conquered	
1847-48 Rebellion in Lower Canada (led by Louis J. Papineau) and Upper Canada (led by William L. Mackenzie)	1901 Commonwealth of Australia proclaimed	
1839 Earl of Durham's Report to Colonial Office on Affairs of British North America this marked the beginning of a new approach to development of colonial territories (towards self government)	1905 Alberta and Saskatchewan provinces of Canada formed	
1840 New Zealand separated from New South Wales Maoris accept Queen Victoria's overlordship in Treaty of Waitangi	1907 New Zealand made a dominion	
1840 Union Act united Upper and Lower Canada, 1841 in accordance with recommendations of Durham Report	1910 Union of South Africa came into being	
1843 Annexation of Sind	1912 Capital of India transferred to Delhi (from Calcutta)	
1862 Second Burma War	1913 Canberra inaugurated as capital of the Commonwealth of Australia	
1856 Natal made a separate colony Oudh annexed	1922 Irish Free State created with dominion status	
1857 The Indian Mutiny	1926 Term British commonwealth of nations first used (at Imperial Conference)	
1858 India Act abolished East India Co and transferred government of British India to the Crown	1931 Statute of Westminster	
	1935 Burma Act, constituting Burma a separate colony 1937	
	1947 Dominions of India and Pakistan created out of British India	

THE UNITED STATES OF AMERICA

1787 Federal Constitution framed by Constitutional Convention	1872 Alabama "dispute with Britain settled by arbitration"	1945 Death of Roosevelt
1790-97 George Washington president	1877-81 Rutherford B. Hayes president	1945 Harry S. Truman president
1790 First Congress meets at New York	1881 James A. Garfield president	1945 Truman orders first atomic bomb to be dropped Allied victory just ended
1797-1801 John Adams president	assassinated the same year succeeded by the vice president Chester A. Arthur	1948-51 European Recovery Programme
1801-09 Thomas Jefferson president	1882 First Federal Act passed to control immigration	1948-49 Airlift (with U.K. co-operation) defeats Russian blockade of Berlin
1803 Louisiana purchased from France	1885-89 Grover Cleveland president	1949 U.S.A. a party with Canada and Western Europe to the North Atlantic Treaty
1809-17 James Madison president	1889-93 Benjamin Harrison president	1950-53 Fighting in Korea, U.S.A. providing majority of U.N. troops
1812-15 War with Britain	1893-97 Grover Cleveland president	1951 Twenty-second Amendment limits presidential terms of one person to two
1817-25 James Monroe president	1897-1901 William McKinley president	1953 Dwight D. Eisenhower president
1823 Monroe Doctrine laid down (American continent no longer subject to further colonisation by Europe)	1898 War with Spain, which ceded the Philippines Puerto Rico and Guam to the U.S.A. and freed Cuba	
1825-29 John Quincy Adams president	1898 Annexation of Hawaii	
1829-37 Andrew Jackson president	1900 U.S.A. acquired eastern Samoa Islands	
1847-41 Martin van Buren president	1901 President McKinley assassinated	
1841 William Henry Harrison president	1901-09 Theodore Roosevelt president	
did the same year succeeded by the vice president John Tyler	1901 Hay-Pauncefote treaty allows U.S.A. to build Panama Canal	
1845-49 James K. Polk president	1909-13 William Howard Taft president	
1846-48 Mexican War	1913-21 Woodrow Wilson president	
1849-50 Zachary Taylor president	1917 War declared against Germany	
1850-53 Millard Fillmore president	1920 Under the Eighteenth Amendment, 1919, federal Prohibition (already in force under war time Act) confirmed	
1852 "Uncle Tom's Cabin" published	1921-23 Warren G. Harding president	
1853-57 Franklin Pierce president	1921 U.S. Peace Treaty with Germany signed in Berlin	
1857-61 James Buchanan president	1921 and 1924 Acts passed greatly restricting immigration from Europe	
1860 South Carolina secedes, other southern states secede to form a confederacy	1921-29 Calvin Coolidge president	
1861-65 Abraham Lincoln president	1929-33 Herbert C. Hoover president	
1861-65 Civil War	1933-45 Franklin D. Roosevelt president	
1865 Lee surrenders at Appomattox Court House	1933 Twenty-first Amendment repealed the Eighteenth Amendment	
1865 Lincoln assassinated	1941 Luce-Lend Act passed (March, Japan attacks the U.S.A., which declares war on Japan, Germany and Italy declare war on U.S.A. (Dec)	
1865-69 Andrew Johnson president		
1865 Thirteenth Amendment prohibits slavery		
1867 Alaska purchased from Russia		
1868 Fourteenth Amendment declares all freedmen citizens with same civil rights as white persons		
1869-77 Ulysses S. Grant president		

HOUSEHOLD SCIENCE

HOUSEHOLD science deals with the natural, economic, and social foundations of home life. The four main topics which it treats are shelter, food, clothing, home management. In this Outline there are gathered together references to the chief articles and portions of articles that will help anyone interested in the art of homemaking.

I. THE HOME AND ITS EQUIPMENT.

- A. Heating (4-149). Importance of keeping the house at the proper temperature; different heating systems; use of fans to keep the air fresh (3-340). Coal (2-426).
- B. Lamps and Lighting (4-442).
 - a. Electric lighting (3-217).
 - b. Gas lighting (3-505).
 - c. Gas and electric meters (5-183).
 - d. Matches (5-146).
- C. Locks and Keys (4-534).
- D. Furnishings and Decoration.
 - a. Wall coverings: wallpaper; paint (6-37); distemper (6-38); tapestry (7-224).
 - b. Floor coverings: carpets and woven rugs (2-246); linoleum (4-516); matting; fur rugs.
 - c. Furniture (3-490).
 - d. Baskets (1-378).
 - e. Pottery and Porcelain (6-274).
 - f. Labour-saving Devices: vacuum-cleaner; washing machine; electric or gas heated iron; washing-up machine; time switches; etc.

II. SANITATION, VENTILATION, AND HYGIENE.

- A. Keeping the Home in Sanitary Condition: House-cleaning; care of food; keeping the drinking water pure and the air fresh. Laundry and dry cleaning (4-454).
 - a. Insect pests: flea (3-388); house-fly (3-401; 4-264); etc.
 - b. Mice (5-288) and rats (6-365).
 - c. Mildews and moulds (5-283).
- B. Hygiene (4-223) and health.
- C. First Aid (3-365; 6-238)
- D. Fire Fighting (3-361) and prevention.

III. FOOD.

- A. Diet (3-90, 409); meals (5-151).
 - a. Carbohydrates (3-409); starch (7-149); sugars and their food value (7-183).
 - b. Fats (5-506; 3-410, 411).
 - c. Proteins (6-297; 3-409, 410).
 - d. Mineral salts (3-409; 5-505).
 - e. Vitamins (7-403).
- B. Some Important Foods (3-408).
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 - b. Food Fishes (3-377): Cod (2-442); haddock (4-115); herring (4-171); salmon (6-489); skate (7-58); etc.
 - c. Eggs used as Food (3-172; 6-297).
 - d. Milk (5-205) and its products; dairy farming (3-25); cheese (2-313); butter (2-134).
 - e. Grain Foods: Flour (3-393); wheat (7-447); barley (1-368); rice (6-396); oats and oatmeal (5-490); etc.
 - f. Legumes or "pod" foods: beans (1-390); peas (6-99); lentils (4-482).

g. Root, Bulb, and Tuber Foods: radishes and turnips (2-151); beets (1-410); carrots; onions (5-511); potatoes (6-273); parsnips (6-93); etc.

h. Leaf and Stalk Foods: Cabbage and cauliflower (2-151); artichoke (1-257); asparagus (1-274); celery (2-286); lettuce (*f.l.*); spinach; rhubarb (6-396).

i. Fruits (3-478): Orange (5-524); pears (6-100); prunes (6-298); raspberry (6-364); strawberry (7-173); nuts (5-486); apples (1-185); bananas (1-359); grapes (4-61); gooseberry (4-47); tomato (5-131); cucumber (3-9); marrow (5-135); etc.

j. Foods used for their taste or flavour: sugar (7-183); spices and condiments (7-131); pepper (6-121); salt (6-490).

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- b. Canning (2-210).

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- b. Coffee (2-444).
- c. Cocoa and Chocolate (2-438).
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- b. Schools (6 503); school meals (5-153).
- c. Universities (7-367).

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- a. Dogs (3-100).

- b. Cats (2-261).

- c. Birds (2-207).

- d. Hamsters (f.;4).

B. Some Useful Animals.

- a. Egg Producers: poultry (6 277) and ducks (3-130).

- b. Milk producers: cow (5 203) and goat (4-37; 5-203).

- c. For riding: horses (4-196) and ponies; donkeys (1-275; 7-270).

INDUSTRIES AND APPLIED SCIENCES

INDUSTRIES and applied sciences form the backbone of modern civilization. A complete study of their field would encompass the whole fabric of practical daily life. This Outline is intended merely as a general survey of the chief materials of industry and of the principal ways in which they are obtained and used, together with a summary of the important sources of power and methods of transport and communication.

I. RAW MATERIALS AND HOW THEY ARE OBTAINED.

A. Minerals (5-213).

a. Mining (5-215).

- 1. Coal (2-426); petroleum (6-147); natural gas (5-331).

- 2. Metals (5-177): iron (4-288); copper (2 502); lead (4-463); aluminium (1 127); mercury (5-173); nickel (5-432); tungsten (7 324); gold (4 38); silver (7-56); platinum (6-221); manganese (5-112); etc.

- 3. Precious stones (7-164); diamonds (3-82).

- 4. Other common minerals: salt (6 490); sulphur (7-186); potash (1 111).

b. Quarrying (6-319).

- 1. Building stones: granite (4 60); marble (5-120); slate (7-65).

- 2. Other minerals: clay (2 406); sand (6 495); chalk (2-299); asbestos (1-262); mica (5-189).

B. Vegetable Materials.

- a. Food Crops: wheat (7-447), barley (1-368), rice (3-396), and other grains; fruit (3-478); vegetables; spices (7-131); nuts (5-486); ground nuts (4-98).

b. Timber (7-277).

- 1. Woods: *see* articles on the various trees under their names.

- 2. Forestry (3-422).

- c. Some other vegetable materials: tobacco (7-286); camphor (2-192); cellulose (2-287); cork (2-505); coconut palm (2-441); lacquer (4-434); natural rubber (6-464); cotton (2-516); flax (3-387); kapok (4-393).

C. Animal Materials.

- a. Domestic animals are treated in the Outline on Agriculture (3-63).

b. Hunting.

- 1. Furs (3 496).

- 2. Ivory (4-331); bone (1-518).

- 3. Perfume (6-123; 5-309).

- 4. Feathers (3-344).

c. Fishing.

- 1. Fish and Fisheries (3-377); *see also* articles on the various fishes.

- 2. Sea Mammals: whale (7-445); porpoise (6-265); seal (6-525); walrus (7-417).

- 3. Reptiles (6-388); turtle (7-294).

- 4. Shellfish: oyster (6-23); crab (2 523); lobster (4-533); shrimp (7-44).

- 5. Other sea products: coral (2 504); pearls (6-101); sponges (7-137).

- d. Raw Materials used for cloth making: silk (7-53); wool (7 473).

- e. Other animal materials: honey (1-406, 408 diag.); lac (4-434; 6 389).

II. POWER AND HOW IT IS APPLIED.

- A. Fuel Engines: steam engine (7-152); boiler (1-504); Diesel engine (3-88); gas engine (3-507); gas turbine (7-330); Bunsen burner (2-124); internal combustion engines (4-273).

- B. Water. Dams and barrages (3-29); hydro electric installations (4-217); hydraulic machinery (4-215); water turbine (7-329).

- C. Air. Windmill (7-459); pneumatic machines (6-230).

- D. Electricity (3-210). Dynamos (3-142) and batteries (1-386); electronic devices (3-221); photo-electric devices (6-162); electric motor (5-275); thermionic valve (7-377).

- E. Animals. For hauling agricultural machinery, carriages, wagons, and to carry burdens: horse (4-196; 1-73); ox; mule (5-292); pony (2-432); camel (2-183); llama (4-530); yak (7-511); dog (3-100).

III. TRANSPORT AND COMMUNICATION.

A. Land Transport.

INDUSTRIES AND APPLIED SCIENCES

- a. Roads (6-404); bridges (2-61); tunnels (7-325); railways (6-354); locomotives (5-1).
- b. Vehicles: cycles (3 14); motor vehicles (5-277).

B. Water Transport.

- a. Waterways: canals (2-204) and rivers; lakes (4-438); ocean routes.
- b. Craft: boats (1 497) and yachts (7-28, 29); ships (7 28).

C. Air Transport: airships (1 83); aeroplanes (1 27); "Autogiros" (1 326) and helicopters (4 157).

D. Communication: telephone (7 240); teleprinter (7 239); telegraph (7 237); radio (6 340); cable (2 152); television (7-251).

IV. MANUFACTURING.

A. Metal Working.

- a. Industries concerned with the extraction of metals: *see* under metallurgy (5 176); smelting and refining (2 447).
- b. Industries concerned with shaping and finishing metals: blast-furnace (1 482); welding (7 436); electroplating (3 223).
- c. Metal products.
 - 1. *See* under names of chief metals in Fact-Index; *see* also article on alloys (1 114).
 - 2. Machinery: conveyors (2 491), dynamos (3 210); lifts and escalators (4 495); engines (*see f.v.*) of all kinds, etc.
 - 3. Other devices made of metal: armour-plate (1 244); cables (2 155); "tin" cans (2 210); firearms (3 357); artillery (1 258); clocks and watches (2-412); nails (5 313); pins (6-202); plough (6 223); cookers (2 496); stoves (4-149); wire (7 462); etc.

B. Building Materials: iron and steel (4 288); granite (4 60); marble (5 120); concrete (2 476); bricks and tiles (2 57).

C. Wood Products and associated industries.

- a. Furniture (3-490).
- b. Other products: baskets (1 378); cricket bats (2 528); bows (1 206); paper (6 62); pencils (6-113); etc.

D. Ceramic Industries: china clay (2 375); porcelain and pottery (6 274); enamel (3 242); glass (4 30).

E. Cloth and Clothing.

- a. Processes in cloth making (2-418): spinning (7-135); weaving (7-433) and the loom (5 36); knitting (4-418); bleaching (1-483); dyeing (3-141; 7-54; 6 369).
- b. Products.
 - 1. Cloth (2-418); felt (3-345); fabrics of cotton (2-516), linen (4-514), silk (7-53),

wool (7 473), nylon (5 487), rayon (6 368), etc.

- 2. Other products: lace (4 429); carpets and rugs (2 246).

c. Clothes (2 420).

- 1. Sewing (7-6); embroidery (3 237).
- 2. Garments: suits; blouses; coats; trousers; shirts; hats and caps (4 136); gloves (4 35); etc.

F. Rubber (6 464) and synthetic rubber (1 10).

G. Leather (4 466).

- a. Kinds of leather: chamois (4 469, 35); pigskin (4-469 *illus.*); shagreen (7 18); crocodile (2-533); etc.
- b. Chief products: gloves (4 35); boots and shoes (2 13).

H. Food Manufactures.

- a. Flour milling (2 393); bread (2 50); biscuits (2 50); etc.
- b. Sugar and sugar products (7 183); beet (1 410); maple (5 117).
- c. Cocoa and chocolate (2 438); coffee (2 444); tea (7 232); salt (6 490); butter (2 134); cheese (2 313); margarine (5 124).
- d. Preserving food: canning industry (2 210); refrigeration (6 378).

I. Paper Making (6 62).

J. Printing (6 288).

- a. Printing processes: electrotyping (*f. i.*); process engraving (6 292); "Linotype" (4 516); "Monotype" (5 246).
- b. Books (2 1); newspaper (5 403).

K. Photography (6 169).

L. Amusements: cinema (2 389); circus (2 403); television (7 251); radio (6 340); theatre (7 263).

M. Miscellaneous Manufactures: drugs (3 127); opium (5 521); explosives (3 328); detergents (3 78) and soap (7 78); candles (2 210); celluloid (2 287); plastics (6 219); turpentine (7-338); musical instruments (3 507); coal-tar (2 433).

V. ENGINEERING AND ENGINEERING CONSTRUCTION.

A. Building Construction (2 111).

B. Shipbuilding (7 28).

C. Heating (4 149).

D. Sanitation: water supply (7 425); aqueducts (1-188); reservoirs (7-425, 426).

E. Highway and Waterway Construction: roads (6 404); railways (6-354); tunnels (7 325); bridges (2-61); harbours and ports (4-130); canals (2 204); dredgers (3 125); excavators (3-325); dams (3 29).

F. Mine Construction (5 215).

LANGUAGE AND LITERATURE

LANGUAGE is the tool of thought. To think clearly, and to grasp firmly the expressed thoughts of others, requires a knowledge of words and of their exact meaning, and of the manner in which words are put together into phrases and sentences. But language is a gradual growth, rooted in custom and tradition, improved by centuries of development, enriched by the skilful use of generations of great minds. The study of grammar alone will not, therefore, give the mastery of language essential to clear thought and understanding. The necessary intuitive "feel" for a tongue comes only to those who steep themselves in its great literature, past and present.

I. THE THEORY OF LANGUAGE.

A. Philology (6 158). the science of the growth and relationship of languages.

- a. **Etymology**, the history of words (6 158).
 1. Etymology of English words (3 281).
 2. Origin of place and personal names (5 314).
- b. **Language Types** (6-158).

B. Grammar, the science of the correct use of language (4 54).

- a. **Sentence** (6 531). phrases and clauses; sentences classified according to structure.
- b. **Parts of Speech** (4 55): nouns (5 468), verbs (7 390), pronouns (6 294), adjectives (1-19); adverbs (1 21), conjunctions (2 484); prepositions (6 283), interjections (4 55).
- c. **Punctuation** (6 309).

C. Rhetoric: the art of effective and pleasing use of spoken language (6-390), figures of speech (3 351).

II. THE LANGUAGES OF VARIOUS PEOPLES

A. African Languages (6-158).

B. Asiatic Languages:

- a. Of China (4-445).
- b. Of India (4 445).
- c. Hebrew (4 151).
- d. Arabic (3 88).

C. European Languages.

- a. **Aryan** (1-261).
 1. Teutonic (7 260): English (3 281), German (4 12); Norwegian, Dutch, etc.
 2. Celtic (4 445). Irish (4 285); Manx, Gaelic (3 497), Welsh (7 414). Breton (2 90).
 3. Romance (6 427). French (3 453), Italian (4 449), Spanish (7-121); Portuguese (6 268).
 4. Slavonic (7-86). Russian (1 120; 5 239), Polish (6 238); Serbian, Croat, Slovene, Macedonian (7 518).
- b. **Non-Aryan**. Magyar (4-206); Finnish (3 354), Basque (7-103).

D. Languages of Indigenous American Peoples:

- a. Indian (6-158, 371, 372).
- b. Eskimo (also in Asia).

E. Ancient Languages (1-204): Greek (4 92); Latin (4-449); Sanskrit (1-262, 6-158).

III. RECORDED LANGUAGE.

A. Writing.

- a. Ideographic writing (1-119; 2-365) and hieroglyphics (4-174). (See also in Fact-

Index panels describing history of each letter of the English alphabet.)

b. Cuneiform writing (1 336, 119 illus.; 5 176; 6-129).

c. Alphabetic writing (1 119).

d. Shorthand (7 42)

e. Methods and materials: writing (7 503), typewriter (7 341); papyrus (6 71), paper (6 62); pen (6 111; 2-3, 2 1); pencil (6 113); ink (4 261, 2 1).

B. Printing (6 288).

a. Type and Typography (7-399).

1. "Linotype" (4 516).

2. "Monotype" (5 246)

b. Products of the printing press: books (2-1), newspapers (5 403), magazines, and other periodicals.

IV. FORMS OF LITERATURE.

A. Poetry (6 233):

a. Lyric (3 284, 6 235).

b. Dramatic (6 235). The plays of Shakespeare (7 12) are the outstanding example of dramatic poetry

c. Epic (6 235). Milton's "Paradise Lost" (5 211); Spenser's "Faerie Queene" (7 130)

B. Prose Forms: romance (5 471); novel (5 470), essay (*f.i.*), biography (1 446); autobiography (1 447), diary (3 8).

C. Drama (3 114). Morality plays (3 118, 117 illus.).

V. NATIONAL LITERATURES.

A. Hebrew Literature (4 151). The Bible (1-440), Job (4 377)

B. Other Asiatic Literatures:

a. Arabian: *Arabian Nights* (1 196); the story of Aladdin (1-197).

b. Chinese (2-365).

c. Indian (4 249).

C. Ancient Mediterranean Literatures.

a. Greek Literature (4 92).

1. Great writers: Homer (4 189; see also stories of Odysseus, 5 500, and of the siege of Troy, 7-320); Aesop and his fables (1-45); Herodotus (4-170); Socrates (7-81), Plato (6-222); Aristotle (1 228); Xenophon (7-506); Demosthenes (3-70); Plutarch (6 228).

2. Great dramatists: Aeschylus (1-45), Sophocles (7-85); Euripides (3-307); Aristophanes (1-227).

b. Latin Literature (4-449).

Great writers: Cicero (2-387), Caesar (2-161).

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Virgil (7-402; *see also* the story of Aeneas, 1-25); Horace (4-198); Livy (4-527); Catullus (4-450).

D. English Literature (3-283).

a. Early literature: *Beowulf*, the great Anglo-Saxon epic (1-431); Arthurian Legends (1-256); Legends of Robin Hood (6-416, 417).

b. Chief poets and their works: Caedmon (2-159); Geoffrey Chaucer (2-311; *see also* *Canterbury Tales* re-told, 2-312, 313); Edmund Spenser (7-180); Christopher Marlowe (5-133); Sir Walter Raleigh (6-362); Ben Jonson (4-382); William Shakespeare (7-12; *see also* *As You Like It*, 1-285; *Hamlet*, 4-122; *King Lear*, 4-409; *Macbeth*, 5-61; *Merchant of Venice*, 5-173; *A Midsummer Night's Dream*, 5-200; *Othello*, 6-9; *Romeo and Juliet*, 6-449; *The Tempest*, 7-256); John Milton (5-209; *see also* the story of "Paradise Lost," 5-211); John Dryden (3-129); Alexander Pope (6-258); William Cowper (2-522); William Blake (1-482); Robert Burns (3-132); Sir Walter Scott (6-517); Samuel Taylor Coleridge (2-448); William Wordsworth (7-476); Lord Byron (2-147); Percy Bysshe Shelley (7-24); John Keats (4-394); Elizabeth Barrett Browning (2-94); Robert Browning (2-95); Lord Tennyson (7-257); Thomas Hardy (4-131); Rudyard Kipling (4-412); Hilaire Belloc (1-423); John Masefield (5-144); Robert Bridges (2-68); T. S. Eliot (3-291).

c. Chief prose writers and their works: Sir Thomas Malory (5-97), author of *Morte d'Arthur* (1-256; 3-284; 4-54); Francis Bacon (1-340); John Bunyan (2-125; story of *Pilgrim's Progress*, 2-126); Daniel Defoe (3-65); Jonathan Swift (7-204; story of *Gulliver's Travels*, 7-205); Joseph Addison (1-15); Samuel Johnson (4-379); James Boswell (2-22); Oliver Goldsmith (4-42); Edmund Burke (2-129); Charles Lamb (4-140); Sir Walter Scott (6-517); Jane Austen (1-311); George Borrow (2-20); The Brontës (2-91); Lord Macaulay (5-53); Thomas Carlyle (2-243); John Ruskin (6-471); William Makepeace Thackeray (7-260); Charles Dickens (3-86); George Eliot (3-229); Charles Kingsley (4-409); Lewis Carroll (2-251; extract from *Alice in Wonderland*, 2-252); Thomas Hardy (4-131); Robert Louis Stevenson (7-156); Rudyard Kipling (4-412); Sir James Barrie (1-372; story of *Peter Pan*, 1-373); Hilaire Belloc (1-423); Arnold Bennett (1-429); G. K. Chesterton (2-331); John Galsworthy (3-499); H. G. Wells (7-438); James Joyce (*f.i.*); W. Somerset Maugham (*f.i.*; 3-291, 260 illus. *f.*).

E. Irish Literature (4-287).

F. American Literature (7-363).

a. Chief poets: William Cullen Bryant (7-364); Edgar Allan Poe (6-232); Ralph Waldo Emerson (3-241; 7-364); Henry Wadsworth Longfellow (5-34; story of

Hiawatha, 5-35); John Greenleaf Whittier (7-364); Walt Whitman (7-449); Emily Dickinson (7-366); Nicholas Vachell Lindsay (7-366).

b. Chief prose writers: Benjamin Franklin (3-460); Washington Irving (4-296); James Fenimore Cooper (2-499); Edgar Allan Poe (6-232); Nathaniel Hawthorne (4-142); Oliver Wendell Holmes (7-364); Henry David Thoreau (7-364); Bret Harte (7-365, 364 portrait); Artemus Ward (7-366); William Dean Howells (7-365); O. Henry (7-365); Louisa May Alcott (1-97); Mark Twain (7-338); Harriet Beecher Stowe (7-364); Henry James (*f.i.*); Theodore Dreiser (7-365); Thornton Wilder (7-366); H. L. Mencken (7-366); Edith Wharton (7-365); Eugene O'Neill (7-366); Upton Sinclair (7-366; *f.i.*); Sinclair Lewis (7-365); Ernest Hemingway (7-365); William Faulkner (*f.i.*).

G. Canadian Literature (2-203).

H. Australian Literature (1-321).

I. South African Literature (7-92).

J. French Literature (3-453).

a. Early romance (5-471): story of Roland (3-454).

b. Chief writers: Jean Froissart (3-477); François Rabelais (*f.i.*); Michel de Montaigne (5-248); Pierre Corneille (*f.i.*; 3-119); Madame de Sévigné (3-455); Jean Baptiste Racine (6-334; 3-119); Molière (5-231; 3-119); Voltaire (7-406); Jean Jacques Rousseau (6-459); Honoré de Balzac (1-358); Victor Hugo, (4-200); Alexandre Dumas (3-133); Emile Zola (3-456); Alphonse Daudet (3-53); Guy de Maupassant (3-456; 5-448); Anatole France (*f.i.*); Marcel Proust (*f.i.*); Jules Romains (3-456); Georges Duhamel (3-456); André Gide (3-456); André Maurois (*f.i.*).

K. German Literature (4-12).

a. Early literature: Song of the Nibelungs (5-429).

b. Some important figures: Martin Luther (5-53); Johann Wolfgang Goethe (4-37); Johann Christoph Friedrich Schiller (6-502); Heinrich Heine (4-157); Heinrich and Thomas Mann (4-14); Arnold Zweig (4-14); Rainer Maria Rilke (4-14); Albert Schweitzer (6-508).

Austrian authors of note include Arthur Schnitzler (*f.i.*); Franz Kafka (*f.i.*); Stefan Zweig (4-14).

L. Russian Literature (6-480).

Some noted writers: Feodor Dostoevski (3-108); Ivan Turgenev (6-480); Leo Tolstoy (7-289); Alexander Pushkin (*f.i.*); Anton Chekhov (3-122; 6-480); Maxim Gorki (6-480).

M. Italian Literature (4-329).

Some noted writers: Dante Alighieri (3-45); Torquato Tasso (4-329); Petrarch (4-329; 6-384); Giovanni Boccaccio (4-329; 6-384); Carlo Goldoni (3-119; 4-330); Giacomo

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Leopardi (4-330); Giuseppe Mazzini (5-151; 4-330, 316); Alessandro Manzoni (4-330); Gabriele d'Annunzio (1-159); Luigi Pirandello (*f.-i.*).

N. Iberian Literature.

a. Spanish literature (7 121).

Some noted writers: Miguel de Cervantes Saavedra (2-294; story of *Don Quixote*, 2-295); Pedro Calderon de la Barca (7 122; 3-119); Ramon Pérez de Ayala (7-122); Serafin and Joaquin Alvarez Quintero (7-122); Garcia Lorca (*f.-i.*).

b. Portuguese: Luis de Camoens (6 268).

O. South American Literature (7 101).

P. Scandinavian Literature.

Some noted writers: (Norwegian) Bjørnstjerne Bjørnson (*f.-i.*); Henrik Ibsen (4-227); Knut Hamsun (*f.-i.*); (Swedish) Emanuel Swedenborg (7-204); August Strindberg (*f.-i.*); Selma Lagerlöf (*f.-i.*).

Q. Literature of the Low Countries.

Some noted authors: Joost van den Vondel; Jacob Cats; Desiderius Erasmus (3-295). Louis Couperus (*f.-i.*); Emile Verhaeren; Maurice Maeterlinck (5 72; 1-105; story of *The Blue Bird*, 5 78); Emil Cammaerts.

MATHEMATICS

SOMETHING of the scope of modern mathematics is indicated in the general article (5 147). As a first step, however, the rudiments of the subject (as it were, the language in which mathematics is written) have to be learned.

I. ELEMENTARY MATHEMATICS.

A. Arithmetic. School arithmetic begins with the basic operations of addition (1-16), subtraction (7 177), multiplication (5 293), and division (3 96); together with other techniques necessary to the manipulation of figures, *e.g.* the handling of fractions (3 428) and decimals (3 57), factorisation (3 335), and the extraction of roots (5-474). It then goes on to apply these techniques to various situations that arise (or are supposed to arise) in everyday life (1 237), *e.g.* mensuration (5-170), percentages and interest (6-122).

Nowadays the labour of computation can be lightened by the use of such devices as logarithms (5-17), slide rules (7-67), and mechanical or electronic computers (2-167).

B. Algebra. School algebra is concerned chiefly with the manipulation of letters considered as substitutes for numbers; the solving by this means of equations in one or more unknowns; and the application of this technique to the solution of problems (1-105).

C. Geometry. School geometry is based on Euclid, and is often considered more valuable as an introduction to the general principles of mathematical proof than for its immediate practical application in everyday life (3 517).

D. Trigonometry. School trigonometry introduces sines, cosines, etc. as ratios between sides in a right-angled triangle, and applies them to practical problems in the solution of the general triangle. Exercises in the proving of identities provide practice in the manipulation of the circular functions (7-316).

Spherical trigonometry is concerned with the solution of triangles on the surface of a sphere and is of practical value in navigation and surveying.

II. HIGHER MATHEMATICS.

A. Theory of Numbers. Often called the Higher Arithmetic. The field of numbers can be extended from ordinary integers to include negative integers, fractions, other algebraic numbers, transcendentals, and complex numbers (5 474).

General theorems about integers are almost as hard to discover as they are to prove. They include:

a. **The Fundamental Theorem of Arithmetic.** Every positive integer except 1 can be expressed as a product of primes, and in every instance this factorisation is unique.

b. **Dirichlet's Theorem.** If a and b have no common factors except 1, then there are an infinite number of primes of the form $an + b$.

c. **Fermat's Theorem.** If p is a prime and n any number not divisible by p , then $n^{p-1} - 1$ is divisible by p .

d. **The Prime Number Theorem.** The total number of primes not exceeding x approaches nearer and nearer to $x/\log x$ as x is made larger and larger.

e. **Fermat's Last Theorem.** The equation $x^n + y^n = z^n$ cannot be solved in integers for any n greater than 2. Fermat claimed to have a proof for this, but did not set it down; no one has since been able to find a general proof.

B. Algebra. Strictly speaking, algebra is concerned only with processes that can be completed in a finite number of operations. An important branch is combinatorial analysis, which includes the theory of probability and statistics (5-148).

a. **The Fundamental Theorem of Algebra.** Every algebraic equation possesses at least one root in the field of complex numbers.

b. **Abstract Algebra** deals with the various different algebras that can be constructed on

MATHEMATICS—MINOR FINE ARTS

the basis of specially defined systems of elements and operations upon them (1-105).

C. Analysis. This is the branch of mathematics that deals with continuous quantities, and uses processes involving an infinite number of operations. Its basic tool is the Calculus, which was invented independently by Newton and Leibnitz in the 17th century. It is almost all included in the theory of functions of a real variable, and the theory of functions of a complex variable.

D. Geometry. The first step outside Euclidean

geometry was the invention of analytical geometry by Descartes in the 16th century. The 19th century saw the development of projective geometry (in which Euclidean geometry ranks as a special case); and the working out of non-Euclidean geometries by Lobachevsky, Bolyai, and Riemann. The tendency among scientists is towards a more and more abstract view of the subject (3 517).

E. Foundations of Mathematics. This branch represents an increasingly rigorous inquiry into the logical foundations on which all mathematical reasoning is based.

MINOR FINE ARTS

UNDER this head are grouped Engraving (3 292), Drawing (3-123), Miniature Painting (3 258) and Illuminating (2 3; 5-116), making of Jewelry (4 371), and other artistic pursuits that have usually been dependent upon the major arts, and, though sometimes carried on by craftsmen doing nothing else, have often been practised by those who are artists in the larger sense.

I. ENGRAVING.

This heading includes very different modes of working, although the principle is the same in all: the production of a block or plate, from which can be printed numerous copies of an artist's original drawing.

A. Wood-engraving. For centuries a great art in China and Japan. Used for the earliest illustration of printed books, and continued for its own sake, as well as for illustration, ever since. Closely allied to it, though rougher, is the line-cut, in which linoleum is used instead of wood.

a. Continental Work: Durer, greatest of wood-engravers (3 138); Holbein (4 185).

b. Some 20th-century English engravers: Clare Leighton (*f.i.*); Eric Gill (6 522); Robert Gibbings (*f.i.*).

c. Japanese Masters: Hosoda Eishi (4 352 illus. *f.*); Hokusai (*f.i.*; 4-353 illus. *f.*); Hiroshige (4 352 illus.).

B. Engraving on Metal Plates. This includes line-engraving, in which the design is cut in a steel or copper plate; dry-point, in which the plate, often of zinc, is engraved directly with a sharp instrument; etching, in which the plate is covered with a layer of wax, in which the design is cut, the metal then being eaten away by acid. Many masters of all the great schools of painting have practised etching. Aquatint is often used to assist etching, as well as on its own. The plate is covered with sand or powdered resin, and bitten through this with acid, producing a finely reticulated surface.

a. Early Workers: Durer, greatest of early engravers and still unrivalled as a line-engraver (3-138); Rembrandt, greatest etcher of all time (6-382; 3-300 illus.); Van Dyck (7-379); Van Ostade, a great Dutch engraver (5-384); Leonardo da Vinci (4-482), and many others of the great Italian masters.

b. Modern Masters. In the 19th century, etching especially underwent a tremendous

revival. The Frenchmen Meryon (*f.i.*) and Legros (*f.i.*; 3 300) were leaders in this revival; in Britain, Whistler was followed by Brangwyn (*f.i.*; 3-273), Muirhead Bone (*f.i.*), and others; America's great etcher is Joseph Pennell; in Scandinavia there was Anders Zorn (*f.i.*).

C. Engraving for Reproduction. Several types of engraving are used, chiefly for the reproduction of paintings by great masters. Among these is mezzo-tinting. "Stipple engraving" is a somewhat similar art. In lithography (4 522; 5 295), very popular for original work, a stone block is used instead of a metal plate. This is really a method of surface-printing, not strictly engraving. Process-engraving (6 292), by means of which many books and magazines are illustrated, cannot be ranked as a fine art.

In England, the mezzotint reached very high standards during the 18th century. Notable workers in this field included Valentine Green (*f.i.*), Bartolozzi (*f.i.*), John Raphael Smith.

II. OTHER GRAPHIC ARTS.

A. Drawing (3 123). Though closely allied to painting, and practised by all artists and designers, drawing in pencil, crayon, ink, pastel, &c., is also an art on its own.

a. Early Draughtsmen: Jean Fouquet (*f.i.*; 3-439); François Clouet (3 439; 2 453 illus.); Leonardo da Vinci (4-482; 3-124 illus.); Rembrandt (6-383; 3-124 illus.); Holbein (4-185; 3-124 illus.).

b. Modern Draughtsmen: Degas (3-449), an outstanding artist in pastel; Picasso (3-124 illus.); Sir Muirhead Bone (*f.i.*); Rothenstein (*f.i.*); etc. Noted illustrators and cartoonists of the 19th and 20th centuries include Tenniel, Keene, Leech, Phil May, Bernard Partridge, Boardley, Rackham, Dulac, Will Dyson, David Low (all in *f.i.*).

MINOR FINE ARTS—MUSIC

B. Illumination, Miniature Painting, Printing. From illuminated manuscripts came the first books, in which the illustrations were drawn separately in each copy. From the miniature pictures thus introduced came the art of miniature painting, which in England was at its best in the 16th, 17th, and 18th centuries. Together with these arts has survived that of calligraphy, or fine writing, used in heraldry, and in drawing up agreements and deeds, and taught also in some schools.

- a. Illuminated Manuscripts (5-116); Book of Kells (2-2).
- b. Fine Printing, book production; William Morris (5-266) and the Kolmscott Press (5-267, 268 illus.).

III. CERAMICS.

The art of making pottery is world-wide, having been discovered independently by many primitive peoples. Porcelain, on the other hand, is an Oriental discovery, copied in Western Europe in comparatively recent times (*see* Pottery and Porcelain, 6-274).

- a. European Pottery: Greek (4-88, 89 illus.); Roman (6-434 illus.); Portland Vase (2-89 illus.); Della Robbia (6-385 illus.); Wedgwood (6-276 illus.).
- b. Oriental Pottery and Porcelain: Chinese (2-363, 369, 372 illus.); Japanese (4-351 with illus.).

IV. METAL WORK, JEWELRY, etc.

- A. Metal Work.** One of the most practical of arts, metal work has been practised since pre-history, for even in the earliest times ornamental as well as useful metal work was produced.
- B. Jewelry** (4-371). Closely allied to ornamental metal work, the art of making jewelry is likewise extremely ancient. *See also* Cameo (2-189).
- C. Enamelling** (3-242; 4-372). This difficult art combines skilled metal work with jewelry.
- D. Carving.** Though closely allied to sculpture, carving often entails more detailed work. Wood carving has been practised for centuries. Great carvers: Grinling Gibbons (4-19; 3-401);

Montanes (7-112). Ivory carving (4-352, 354 illus.).

V. CABINET-MAKING AND INTERIOR DECORATION.

- A. Furniture** (3-400). Allied with architecture, cabinet-making (2-234) has often been practised by the same men. From early times, the rich devoted great attention to interior decoration and the furnishing of their homes, even of their tombs.

From early crude works in local woods, furniture gradually became artistic. In England, the line can be traced from simply designed, often well-ornamented, Elizabethan and Tudor work through the more delicate Jacobean, to the walnut furniture of William and Mary, and thence to Chippendale (3-491, 493 illus.), Hepplewhite (3-491, 493 illus.), Sheraton (3-491, 493 illus.), and Adam (1-14; 1-217; 3-491), when mahogany and rosewood replaced English woods. French influence was then paramount for fifty years. In the late 19th century William Morris's group of workers, among them Ernest Gimson (3-494), revived fine furniture in England. Ambrose Heal, Gordon Russell, and others have renewed interest in English woods and influenced 20th-century design.

- B. Tapestry.** Allied with interior decoration was the art of tapestry weaving (7-224, 226 illus.), now more or less dead. From the Middle Ages to the 18th century, tapestry was a usual wall covering, the most famous being that made at the Gobelins factory (*f. i.*; 3-439). Artists as famous as Raphael (6-363) designed tapestries for their great patrons.

- C. Weaving and Embroidery.** These domestic arts, which are of great antiquity, have now almost disappeared in the age of machines, though many examples exist in museums and private collections.

- a. Spinning (7-135) and weaving (7-433).
- b. Embroidery (3-237) and lace-making (4-429); Japanese embroidery (4-352 illus.); Bayeux "tapestry" (1-389 with illus.).

MUSIC

MUSIC is organized sound; noise is unorganized sound. The composition and practice of music are arts, and should produce sound pleasing to the ear. But it must be remembered that compositions displeasing to one generation or national group may well be pleasing to another. That is to say, Man's idea of pleasurable sound is not static, but varies with the age in which he lives and the place in which he happens to be born.

I. NATURE OF MUSIC.

- A. Music** (5-302) and its Physical Basis. *See also* Sound in the Physics Outline (8-179).
- B. Three Elements of Music.**

- a. Rhythm: regular recurrence of tone groups in which individual notes are symmetrically arranged according to accent and time value.
- b. Melody: a succession of simple tones constituting a musical phrase.
- c. Harmony: simultaneous blending of sounds called "chords," with interweaving "parts."

- C. Written Music** (5-303, 304 illus.).

- a. Staff and Notes.
- b. Time in Music (7-279).

II. SOME IMPORTANT FORMS OF MUSICAL EXPRESSION.

- A. Suite:** A composition consisting of several varied movements, originally intended for one instrument, now often written for an orchestra.
- B. Sonata:** An instrumental composition in three or four movements, for piano or for solo instrument with piano accompaniment.

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- C. **Concerto** : A composition in sonata form for a solo instrument and orchestra.
- D. **Symphony** : A large scale sonata for an orchestra. A few "choral" symphonies also exist.
- E. **Oratorio** : A semi-dramatic choral work of large scope with vocal solos and orchestra.
- F. **Opera** (5-513) : Musical form of drama with solos, choruses, orchestra, scenery, and acting.
- G. **Cantata** : A composition either sacred or secular for solo voices and chorus; shorter than an Oratorio or Opera.
- H. **Anthem** : A composition in common use in church services; sometimes for full choir throughout or for two choirs, and sometimes with solo parts introduced; organ accompaniment is usual.
- I. **Hymn** : A form of composition used in religious services; it varies considerably in measure owing to the variety of metres used in the words.
- J. **Canon** : A composition in which one part follows another over the same notes, separated perhaps by an octave, but exactly imitating its movement.
- K. **Rondo** : A bright movement in which the principal subject keeps recurring, in the same key.
- L. **Fugue** : A movement beginning with a subject in single notes, which is given out by one part and answered by other parts in turn, subject and counter-subjects forming an harmonious whole.

III. MUSICAL INSTRUMENTS (5-307).

- A. **Stringed Instruments** : harpsichord (6-194; 5-307 illus.); piano (6-194); harp (4-133); violin, viola, violoncello, double bass (7-401); guitar (*f.i.*; 5-309); mandolin (*f.i.*; 5-309); banjo (1-361).
- B. **Wind Instruments**.
 - a. **Woodwind Instruments** (7-473) : flute; piccolo; fife; oboe; English horn; bassoon; clarinet.
 - b. **Brasses** : French horn (4-194); trumpet (7-322); cornet; trombone; tuba; saxophone (5-307, 308 illus.).
 - c. **Other wind instruments** : accordion (bellows-mechanism); bagpipe (1-347); organ (6-1).
- C. **Percussion Instruments** (5-307).
 - a. **Drums** (3-128) : kettledrum (5-307 illus.); tympani; bass drum; side or snare drum.
 - b. **Bells** (1-424); triangle; glockenspiel; xylophone; cymbals; etc.
- D. **Orchestra** (5-526) : a group of instruments and their players.

IV. HISTORY OF MUSIC.

- A. **Hebrew Music** (5-302).
- B. **Greek Music** (5-302).
- C. **Development from the 4th to the 17th century A.D.** (5-302).
 - a. Guido of Arezzo and the invention of the musical staff (5-303).
 - b. Rise of secular music (5-304).
 - c. Development of counterpoint (5-303).
 - d. Palestrina and the perfection of the Mass (5-304).
- D. **Great Modern Composers, and their contribution to the development of music.**
 - a. **Henry Purcell** (6-311). England's first great composer.

- b. **Johann Sebastian Bach** (1-339). Profound and original musical thinker; link between polyphonic and harmonic styles.
- c. **George Frederick Handel** (4-126). Great master of the oratorio; outstanding writer for the voice.
- d. **Christoph Willibald Gluck** (*f.i.*). First writer of modern opera; greatest composer of dramatic music before Mozart.
- e. **Franz Joseph Haydn** (4-142). Great master of the symphony and the orchestra.
- f. **Wolfgang Amadeus Mozart** (5-289). Universal genius in music; he raised all musical forms, except the oratorio and the fugue, to a point never reached before, and comic opera to a height "never since approached within classical limits."
- g. **Ludwig van Beethoven** (1-411). Greatest orchestral composer of the 19th century; profound symphonist.
- h. **Carl von Weber** (*f.i.*). Founder of the romantic school of German opera.
- i. **Franz Schubert** (6-507). First, and perhaps greatest, classical song writer.
- j. **Felix Mendelssohn** (5-169). Flawless craftsman; much influenced by Bach, whose music he helped to bring back into favour.
- k. **Frédéric François Chopin** (2-378). Created a new style of composition for the piano and added a new national element to music.
- l. **Hector Berlioz** (*f.i.*). Master of impressionist orchestration.
- m. **Robert Schumann** (6-507). Romanticist composer whose songs rank with those of Schubert and his "piano lyrics" with those of Chopin.
- n. **Franz Liszt** (4-522). Pioneer of the symphonic poem.
- o. **Giuseppe Verdi** (7-391). Greatest Italian composer of the 19th century; a master of opera.
- p. **Richard Wagner** (7-408). Creator of a new form of music drama; harmony, orchestration, and counterpoint were greatly advanced by him.
- q. **Johannes Brahms** (2-39). A prolific and versatile master of orchestration; lyrical writer for voice and piano.
- r. **Piotr Ilyich Tchaikovsky** (7-231). Outstanding Russian composer; master of orchestration, and of the musical expression of emotion.
- s. **Antonin Dvorak** (*f.i.*). Made extensive use of folk-melodies, especially of Slavonic origin.
- t. **Jan Sibelius** (7-47). The greatest symphonist of the 20th century; Finland's first great national composer.
- u. **Richard Strauss** (7-172). Perfecter of the dramatic "symphonic poem," brilliant and inventive orchestrator, lyric and operatic master.
- v. **Other composers**. **Britten** (5-306, 515); **Debussy** (5-305, 515, 519); **Delius** (3-68; 5-306); **Elgar** (3-227; 5-306); **Franck** (*f.i.*); **Grieg** (4-98; 5-467); **Holst** (5-306); **Ravel** (5-306); **Schönberg** (5-306); **Shostakovich** (*f.i.*; 5-306); **Johann Strauss** (7-172); **Stravinsky** (5-306); **Sullivan** (4-20); **Vaughan Williams** (*f.i.*); **Walton** (*f.i.*).

MYTHOLOGY

THE fascinating stories of Mythology (5-312) represent the first efforts of primitive people to explain the origin of the world and to solve the mysteries of life surrounding them. A study of these myths throws light on the history and customs of the people among whom they originated; and comparison of early myths shows that many were common to various peoples, suggesting possible prehistoric connexions among them. Familiarity with classical myths is necessary for a ready understanding and appreciation of many of the finest passages in literature, ancient and modern, in which allusions to these tales frequently occur.

I. BABYLONIAN MYTHS.

Etana, the shepherd who attempted to fly; Adapa, a fisherman who refused immortality; Babylonian story of the Flood (5 445).

II. ANCIENT EGYPT.

Religious Beliefs and Customs (3-183, 193, 199,

184 illus., 192 illus., 201 illus.).

a. Osiris (6 6), legendary king of Egypt and chief of the gods.

b. Isis (4 301), the Moon goddess, wife of Osiris.

Greek and Roman Mythology

THE mythology of the ancient Romans, a practical people, is based on that of their imaginative and poetical Greek neighbours. For this reason Greek and Roman mythology is considered together; the Roman names are given in brackets after the Greek names, in Anglicised forms where these exist.

I. ANCIENT GREEK THEORY OF THE CREATION.

A. The Origin of Heaven and Earth. How Uranus, Heaven, and Gaia, Earth, came into being (7-370); their children—the Cyclopes (3-16), Hundred Handed, and Titans (7-522, 370; 3-17), temporary power of Kronos (Saturn, 6 500) and Rhea (7-522), and how their son, Zeus (Jupiter, 4-386), became the ruler of the universe.

B. The Origin of Man. The Greeks had several theories regarding the creation of Man. One story relates that Prometheus (6 294), son of the Titan Iapetus, fashioned Man at the request of the gods. By his devotion to mankind, however, Prometheus so enraged Zeus that Zeus caused a woman, Pandora (6 59), to be made to bring trouble to Man, and ordered Prometheus to be chained to a rock. When, later, men had fallen into evil ways, Zeus destroyed them by a flood, saving only Deucalion (*f.i.*), son of Prometheus, and his wife, Pyrrha.

II. HEAVEN AND THE DEITIES WHO DWELT THERE.

The Heaven of the Greek gods was a high mountain, Olympus (1-350; 7-522), with a gate of clouds, opened by the Hours or Seasons. Each god had a separate dwelling, but at the command of Zeus all repaired to his palace, where they feasted on ambrosia and nectar poured by Hebe (Juventas, 4-151), and listened to the music of Apollo (1-183) and the Muses (5-299).

A. The Greater Gods who dwelt on Mount Olympus.

a. Zeus (Jupiter), son of the Titans Kronos and Rhea. Supreme ruler of the universe (4-386).

b. Hera (Juno), his sister and wife. Queen goddess and guardian of woman (4-386).

c. Apollo, son of Zeus and Leto (Latona). God of light and manly beauty and of prophecy, and later, the Sun god (1 183).

d. Artemis (Diana), Apollo's twin sister. Virgin goddess, huntress, as well as guardian, of wild beasts, and later, the Moon goddess (3-86).

e. Ares (Mars), son of Zeus and Hera. God of war (5 136).

f. Hephaestus (Vulcan), son of Zeus and Hera. God of fire and the blacksmith of the gods (1-10; 7 389).

g. Aphrodite (Venus). Goddess of love, who sprang full-grown from the sea foam (7 388; 1 25, 150; 3 21).

h. Hermes (Mercury), son of Zeus. Cunning and swift-footed messenger of Heaven (4 85 illus.; 5 173; 6-128).

i. Athene (Minerva), who sprang fully armed from the head of Zeus. Goddess of storms, of war and of wisdom, of spinning and weaving, and of agriculture, and protectress of cities (1 286; 1 12, 13; 6-128, 153).

j. Hestia (Vesta), sister of Zeus and eldest daughter of Kronos and Rhea. Goddess of the hearth and divinity of the home.

B. Some Lesser Deities of Heaven.

a. Eros (Cupid). Small god of love, son of Aphrodite (3 11).

b. Hebe (Juventas), daughter of Zeus and Hera. Cup bearer of the gods (4 151).

c. Ganymede: a Trojan boy who succeeded Hebe as cup-bearer.

d. The Graces, daughters of Zeus. Goddesses who presided over social matters.

e. The Muses, daughters of Zeus. Presided over the arts and sciences (5 299; 6-6).

f. Themis, a Titan, daughter of Uranus. Goddess of justice who sat beside Zeus on his throne.

g. The Fates. Controlled human destiny (8 342).

h. Nemesis, daughter of Night. Represented righteous anger and the vengeance of the gods.

i. Asclepios (Aesculapius), son of Apollo. His function was the art of healing (1-45).

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j. **Boreas, Zephyrus, Notus, and Eurus.** The winds.

k. **Helios, Selene, and Eos (Aurora),** children of the Titan Hyperion. Helios (7-2), charioteer of the Sun, was the more ancient Greek Sun god, frequently identified with his successor Apollo. Selene was the early Moon goddess, whose attributes and adventures were later merged in those of Artemis. Eos was the rosy-fingered goddess of Dawn, mother of the stars and of the morning and evening breezes (1-310).

l. **Orion,** son of Neptune. Mighty hunter.

m. **Iris.** Goddess of the rainbow.

n. **Nike (Victoria).** Goddess of victory (5-47 illus.).

III. THE EARTH AND THE GODS WHO MADE IT THEIR ABODE.

The Greeks believed that the earth was a flat circle in the centre of which was either Mount Olympus or Delphi, famous for the oracle of Apollo. It was crossed from east to west by the Sea (the Mediterranean and Euxine or Black Sea), while around it flowed in a steady current the Ocean Stream (personified as the Titan Oceanus), from which the sea and all rivers received their waters. Beyond the mountains of the North Wind, in a region inaccessible by land or sea, dwelt the Hyperboreans, in bliss and everlasting spring. In the south, close to the Ocean, dwelt the Ethiopians, a people greatly favoured by the gods. On the western margin lay the Elysian Plain, the abode of the blessed. The dawn, the sun, the moon, and most of the stars rose out of the Ocean to give their light to Man.

A. The Chief Gods of Earth.

a. **Demeter (Ceres),** sister of Zeus. Goddess of agriculture and of civilized life (3-69).

b. **Gaea, or Ge, the Mother Earth,** wife of Uranus. One of the older order of gods (7-370; 3-49).

c. **Rhea, wife of Kronos and mother of Zeus.** Another goddess of earth (7-522).

d. **Dionysus (Bacchus),** son of Zeus and Semele. God of wine and of animal life and vegetation (3-91, 115; 5-198).

B. The Lesser Divinities of Earth.

a. **Pan (Faunus),** son of Hermes. God of the flocks and pastures, of fields and forests (6-52; 3-156).

b. **The Dryads and Hamadryads (5-488),** tree nymphs; the **Oreads,** nymphs of the mountains and grottoes; the **Napaeads,** shy valley nymphs.

c. **The Satyrs (Fauns).** Goatlike deities of woods and fields (3-91, 116 illus.; 6-52).

IV. THE UNDERWORLD AND ITS DIVINITIES.

"Beneath the secret places of the Earth" lay a realm of darkness bounded by awful rivers—the sacred Styx and Acheron, river of woe—where Hades, whose name is given to the region, in a dark and gloomy palace haunted by strange apparitions, ruled the spirits of the dead.

A. Principal Deities of Hades.

a. **Hades (Pluto),** brother of Zeus, ruler of the underworld (6-228, 128; 3-69; 7-522).

b. **Persephone (Proserpina),** daughter of

Demeter and wife of Hades. Goddess of death and also of spring (3-69; 6-228).

B. Lesser Divinities.

a. **Acacus, Rhadamanthus, and Minos,** sons of Zeus and judges of the dead. Minos (3-25; 7-268) during his life had been king of Crete.

b. **Eumenides or Erinyes,** born of the blood of wounded Uranus. Deities who punished those who had escaped from or defied justice; called in English the Furies (*f.-i.*).

c. **Hecate.** Goddess of sorcery and witchcraft (5-250).

d. **Hypnos (Somnus) or Sleep, and Thanatos or Death,** sons of Night.

V. THE GODS OF THE WATERS.

A. **The Older Dynasty.** The Sea had two sets of rulers, the earlier of which flourished during the reign of Kronos. The Titan Oceanus and his sister and queen Tethys, from whom sprang thousands of rivers and numerous ocean-nymphs, ruled the waters from their beautiful palace beyond the boundaries of Earth. There was also Pontus (the deep sea), who was the father of Nereus, a genial old man famous for his prophetic gifts and his love of truth and justice. The children of Nereus and his wife Doris were the fifty fair Nereids (5-488).

B. The Younger Dynasty.

a. **Poseidon (Neptune),** brother of Zeus. Ruler of the waters (6-270; 7-522; 5-367).

b. **Amphitrite,** daughter of Oceanus, eldest of the Titans, and wife of Poseidon.

c. **Triton,** son of Poseidon. A lesser divinity, trumpeter of Ocean.

d. **Proteus.** Little old man of the sea. Son of Poseidon, he had prophetic powers and could change his shape at will.

e. **The Harpies (*f.-i.*),** children of Thaumias, a son of Gaea.

f. **The Graeae (*f.-i.*).** Three hoary witches, grey-haired from birth.

g. **The Gorgons.** Three horrible sisters, whose glance was death (1-130, 286; 6-128).

h. **The Sirens.** Sea nymphs who, by their singing, lured mariners to destruction (5-501).

i. **Scylla.** Six-headed monster destructive to mariners (5-501).

j. **Atlas.** A Titan, who supported the world on his shoulders (4-166; 6-128). Three groups of nymphs—the **Pleiades (*f.-i.*), Hyades, and Hesperides (4-166)**—were daughters of Atlas.

k. **The Oceanids, Nereids, and Naiads,** sea and water nymphs (5-488). The last of these daughters of Zeus were of most importance.

VI. ITALIAN GODS.

Besides the Roman gods already mentioned, there were certain other deities always peculiar to Roman Mythology. Among them the most important were: **Saturn,** the introducer of agriculture (usually identified with Kronos), and **Ops,** his wife, goddess of sowing and harvest (later confounded with Rhea); **Janus,** god of doors or of beginnings, the most important native Italian deity (5-255); **Quirinus,** a war god, the deified Romulus; **Bellona,** a war goddess; **Lucina,** a goddess of light and of childbirth (a name applied to both Juno and

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Diana); Faunus, grandson of Saturn, god of fields, of shepherds, and of prophecy (fauns were a group of woodland deities like the Greek satyrs, 3-91, 116 illus.; 6-52); Sylvanus, god of the forest glades; Flora, goddess of flowers; Pomona (4-120), goddess of fruit trees; the Lares (*f.i.*) and Penates (*f.i.*), household gods, the former being considered as the deified spirits of ancestors who watched over their descendants. Sol (the Sun), Luna (the Moon), Juventas (Youth), Fides (Honesty), Fortuna (Fortune, *f.i.*) and other personifications were also worshipped by the Romans.

VII. LEGENDARY HEROES.

Besides these divine beings, the Greeks and Romans held in veneration a large number of demigods and heroes, some of whom were offspring of the gods.

A. Older Heroes :

- a. Perseus (6-128) : hero of Argos, son of Zeus and Danaë, who was the daughter of King Acrisius of Argos.
- b. Heracles (Hercules, 4 165) : national hero of the Greeks, son of Zeus and Alcmena, the grand-daughter of Perseus.
- c. Cadmus (3-122; 7-266) : founder of Thebes, a descendant of Zeus.
- d. Orpheus (6 6) : famous musician, son of Apollo and the muse Calliope.
- e. Minos (3 25; 7-268) : King of Crete, son of Zeus and Europa.
- f. Oedipus (5-505; 7-131) : King of Thebes, descendant of Cadmus.
- g. Theseus (7-268; 1-130; 2-291) : son of King Aegeus of Athens, a "second Hercules," slayer of the Minotaur.
- h. Jason (1-226; 5-159) : heir to the throne of Iolcus in Thessaly, leader of the Argonauts.
- i. Peleus (7-320; 1-10) : grandson of Zeus, husband of the sea nymph Thetis, and father of Achilles.
- j. Pelops (*f.i.*) : son of Tantalus.
- k. Castor and Pollux (2-261) : twin sons of Zeus.

B. The Younger Heroes : These were sons and grandsons of the Older Heroes and chieftains in the Theban and Trojan Wars and in numerous other military expeditions. Among them were Achilles (1-10); Agamemnon (1-66); Hector (4-152); Aeneas (1-25).

VIII. MYTHS OF THE GODS.

A. Stories of the Greater Gods.

- a. Myths of Zeus: his love for Io (*f.i.*); Zeus and Callisto, a maid of Arcadia (2-489); abduction of Europa (*f.i.*); the punishment of Tantalus (*f.i.*).
- b. Myths of Athene (1-286) : her birth; helping the Greeks at Troy; the naming of Athens; weaving contest with Arachne.
- c. Myths of Apollo (1-183) and Artemis (3-86; 1-67) : Apollo and the deadly python; Hyacinth (4-218) and Apollo; the punishment of Niobe (*f.i.*); Apollo's revenge on King Midas (5-198); the musical contest of Apollo and Marsyas (1-183); Apollo's love for the nymph Daphne (3-49); the fate of Actaeon (*f.i.*) at the hands of Artemis; Orion (*f.i.*) and Artemis.

- d. Myths of Aphrodite (7-388) : birth (*f.i.*); Aphrodite and Adonis (*f.i.*); wedding of Aphrodite and Hephaestus (*f.i.*); Atalanta's race (1-285); Hero and Leander (4-170).
- e. Adventures of Hermes (5-173; 6-128).
- f. Dionysus (3-91) and the pirates.
- g. Abduction of Persephone by Hades (3-69; 6-228).
- h. Poseidon (6-270) and the building of Troy.

B. Myths of the Lesser Divinities.

- a. Myth of Phaethon (*f.i.*), son of Helios, and his rash request.
- b. Asclepius educated by Chiron (*f.i.*).
- c. Myth of the Pleiades (*f.i.*).
- d. Cupid and Psyche (3-11).
- e. Aurora and Tithonus (1-310).
- f. Pan and Syrinx (6-52).
- g. Echo (an Oread) and Narcissus (3-156).

IX. MYTHS OF THE DEMIGODS AND HEROES.

A. Stories of the Older Heroes.

- a. Myths of Perseus (6-128) : the doom of King Acrisius; Perseus and Medusa; Perseus and Atlas; Perseus and Andromeda.
- b. Myths of Heracles (4-165) : his youth; his labours; further exploits; death.
- c. The Argonauts' quest of the Golden Fleece (1-220).
- d. Myths of King Minos of Crete : the Minotaur (*f.i.*); Daedalus and Icarus (3-25; 1-27, 28 illus.).
- e. Myths of Theseus : Theseus and Ariadne (7-268); Theseus and Pirithous and the battle with the Centaurs (2-291).
- f. Orpheus and Eurydice (6-6).
- g. Founding of Thebes by Cadmus (7-266).

B. Myths of the Younger Heroes.

- a. The Trojan War.
 1. Its Origin : the story of Paris (7-320; 4-189), son of King Priam of Troy, marriage feast of Peleus and Thetis (7-320; 1-10); Paris abducts Helen (4-189; 7-320), wife of King Menelaus.
 2. Greek Heroes who took part : Achilles (1-10), son of Pelous and Thetis, the bravest of the warriors; Odysseus (5 500), King of Ithaca; Ajax (1-87) the Great, second only to Achilles in strength and bravery; Agamemnon (1-66), King of Mycenae, commander-in-chief of the Greek forces; gallant Diomedes; aged Nestor, King of Pylos.
 3. Chief Trojan Leaders : Hector (4-152), son of King Priam, one of the noblest figures of antiquity; Aeneas (1-25), son of Anchises and Aphrodite. Among the Trojans' allies was Memnon, King of Ethiopia.
 4. Story of the War : the wrath of Achilles, the shield of Achilles; the Amazons (1-130); the death of Hector; story of the Wooden Horse and the fall of Troy (7-320); the return of Menelaus to Greece.
- b. The Wanderings of Odysseus (5-500) : the lotus-eaters; the Cyclops (3-16); Odysseus and Circe (2-404); the Sirens, Scylla and Charybdis, the island of Calypso, the Princess Nausicaa; Penelope (4-418; 5-500, 503) and the suitors; return of Odysseus.
- c. Adventures of Aeneas (1-25).

Norse and Teutonic Mythology.

THE mythology of the Northmen, who inhabited the countries now called Sweden, Denmark, Norway, and Iceland, has come down chiefly through the Eddas and Sagas (*f.i.*). Cradled in the frozen North, the Scandinavian myths mirror the spirit of the hardy Vikings, and while their gods lack the graceful fancy of the Greek deities, they have a rugged personality well calculated to inspire the warlike Northmen to deeds of prowess.

1. THE GODS AND THEIR MYTHS.

A. The Creation : Scandinavian myths, like those of the Greeks, tell of the development of the world from darkness and chaos. Originally there existed a world of mist, a bottomless deep, and a world of light. From the mist-world issued twelve rivers whose frozen waters gradually filled up the bottomless deep. Then from the world of light issued warm winds which melted the ice, producing vapours which rose and formed clouds. From these clouds sprang Ymir, the prime-cold giant, and his progeny, and a cow, Audhumbla, whose milk furnished nourishment to the giant, and who in turn was nourished by licking the hoar frost and salt from the ice. At last there appeared first the hair, then the head, and at length the whole form of a god of great beauty and power. This was Bori, from whom and his wife, a daughter of the giants, sprang Odin, Vili, and Ve. These three slew Ymir and from his body and blood formed heaven and earth. Of his eyebrows they built a fence around Midgard, the destined abode of Man. Having created the world, they fashioned Man from an ashen spar and woman from a piece of elm. To these first human beings Odin gave life and soul, Vili, reason and motion, and Ve, the senses, features, and speech. The universe was supported by Ygdrasil, a mighty ash tree.

B. Asgard, abode of the Gods, and its Chief Deities (5 500).

a. Odin or Woden (5-500) : ruler of Heaven, Earth, and the Underworld, who lived in a golden palace called Valhalla.

b. Frigga (1 349 ; 3 55) : Odin's wife, who knew all things.

c. The Valkyries : warlike virgins mounted on horseback and armed with helmet, shield, and spear, who conveyed fallen warriors from the battlefields to Valhalla.

d. Thor (7 270 ; 8 55) : the Thunderer, eldest son of Odin.

e. Bragi : son of Odin, and god of poetry.

f. Iduna : Bragi's wife ; custodian of the casket of magic apples, which produced immortal youth.

g. Balder (1 349) : son of Odin, beautiful god of sunlight, spring, and gladness.

h. Hoder : son of Odin, blind god of winter.

i. Frey : god of peace and fruitfulness ; Freyja : his sister, goddess of love.

j. Tyr : a wrestler, " god of battles."

k. Loki (1 349) : the mischief-maker, who, though of the demon race, forced himself into the company of the gods. One of his children was the Midgard Serpent, who encircled the Earth.

C. Jotunheim and the Frost Giants, enemies of the gods (7 270).

D. Some Myths of the Gods :

a. Odin at the fountain of knowledge (5 500).

b. Thor's visit to Jotunheim (7 270).

c. The death of Balder (1 349).

II. MYTHS OF NORSE AND OLD GERMAN HEROES.

In the Norse Saga of the Volsungs are gathered many ancient legends, with Sigurd, a great hero never equalled in comeliness, valour, and great-heartedness, as the central figure. The great epic, *Nibelungenlied*, is the German version of these hero-tales, with certain variations of name, character, and incident. Here Sigurd appears as Siegfried.

A. The Story of Siegfried (5 429).

B. The Song of the Nibelungs (5 429).

Interest-Questions in Mythology

What goddess sprang from the sea-foam ? 7 385

How did the ancient Greeks explain the change of seasons ? 3 60.

Why is the laurel associated with poets ? 6 232.

How did the ancient Greeks explain the origin of fire ? 6-204.

How did three golden apples help a hero to win a race and a wife ? 1-285.

What great Greek city is named after a goddess ? 1 246.

What woman, according to the Greeks, was responsible for all the ills of mankind ? 6-60.

What happened when a man was given immortal life without 1 310.

What girl was turned into a spider ? 1-286.

What god had wings on his sandals ? 5-173.

What is meant when a horseman is said to " ride like a Centaur " ? 2-291.

What sorceress changed men into beasts ? 2-403

What woman brought disaster on herself through curiosity ? 3 11.

What connexion is there between " cereal " and a Roman goddess ? 3 60.

Who, according to the ancient Greeks, was the first man to fly ? 4-224.

What flower sprang from the blood of a beautiful youth ? 4-213.

How, according to the Greeks, did the peacock get the " eyes " in its tail ? 6-101, plate f.

How did the Romans get the name of their chief god ? 4-386.

What youth gazed at his own image until he was transformed into a beautiful flower ? 5 324.

How did a polished shield help Perseus to slay a monster ? 6 124.

How did Odysseus and his men get past the giant Polyphemus without being caught ? 5 101.

How did the god of the vine keep a ship from moving ? 3-91.

Who was the mischievous god that escaped from his cradle and began his adventures when only a few hours old ? 5 173.

Which of the Greek heroes was called " the crafty " ? 5 500.

What common metal was named after a god, and why ? 5 174.

What goddess sprang from the head of Zeus ? 1 246.

Who was the god of music ? 1-183.

What planet is named after the Roman war god, and why ? 5-136

What strait was called " Oxford " in Greek, and why ? 2 21.

How was the lyre invented ? 5 173.

In what mythical country did women have all the rights ? 1-130.

What Norse god gave an eye for wisdom ? 5-500.

After what god is the fourth day of the week named ? 5 500.

What wife of a Greek hero was noted for her fidelity ? 5 503.

How did a woman's beauty lead to a great war ? 7-320.

After what Greek hero is the tendon of the heel named, and why ? 1-11.

What flower sprang from the tears of a goddess ? 1 150.

What power moved the god of the underworld to allow one of the dead to return to life ? 6-8.

NATURE STUDY

Preliminary Readings for Young Children

FOR children not yet old enough to begin Nature Study in a systematic way, the story method is the best introduction to the subject. Interested at first in the adventures of their animal heroes, they soon develop a desire to find out more about the animals themselves and the natural surroundings in which the animals live. The following stories, selected from tales to be found in these volumes, are suited to this purpose. While retaining the full imaginative flavour that appeals directly to the young reader, they serve at the same time to bring out characteristics and habits of the animals in question.

TALES OF THE ANIMAL WORLD

Why the Tortoise Bites so Hard (7-297)

The Tadpole who Wanted to be a Frog (3-473)

How Screecher Learned to Hunt (6-13)

Prickles Learns to Like his Quills (6-261)

Blackface Meets his Neighbours (6-329)

How Goldenings Learned to Fly (7-169)

Adventures of Blackie and Ginger (1-393)

White Tail and the Old Stag's Lesson (3-61)

What Sinbad Found out in the Desert (2-185)

The Legend of the Kingfisher (4-105)

General Outline for Older Students

THE following references provide a foundation for practical Nature Study, such as can be carried out in Britain. While some exotic creatures popular as pets have been included, in general this Outline is confined to those manifestations of plant or animal life that can be found in the British Isles, and it is so arranged as to give a broad basis on which to work. The Outlines on BIOLOGY, ZOOLOGY, and BOTANY should also be studied in order to grasp the scientific basis on which Nature Study is founded. It is especially useful to have read the main articles, to many of which references are given below, and to have come to appreciate inter-relationships among animals and plants, before starting field trips. It should be borne in mind that, no matter how small an area the student is forced to work in, there will be enough material for prolonged study. Outside the boundaries of Nature Study, but related to it, lies the study of Weather (7 433), Soil (7-83), and Geology (3 515).

I. NATURE STUDY (5 332).

II. PLANT LIFE (6 214).

A. **Lower Plants** : bacteria (1 343) ; algae (1-104), seaweeds (6 526) ; fungi (3 488), mushrooms (5 301) ; lichens (4 490) ; moss (5-167) ; liverworts (4 526) , ferns (3 346).

B. **Flowering Plants** : flowers (3 395) ; grass (4 63) ; cactuses (2 157) ; water plants (7 429) ; trees (7 308).

III. ANIMALS (1 156).

A. Some of the commoner animals.

a. **Lower Types** : amoeba (1-140) ; protozoa (6 298) ; worms (7 500).

b. **Arthropods** : crabs (2 523) ; lobsters (4 533) ; insects (4-264) ; ant (1 160) ; bee (1 405) ; beetle (1 412) ; butterflies and moths (2 136) ; caterpillars (2 263) ; fly (3 401) ; grasshopper (4-64) ; wasps (7 420) ; centipodes (2-291) ; millipedes (1 154) ; woodlice (7 467) ; spiders (7-132).

c. **Molluscs** (5 232) : cockles and mussels (2-437) ; snails and slugs (7 73) ; cuttlefish, squids, and octopus (3 12).

d. **Fishes** (3-377) : carp (2-245) ; eel (3 170) ; salmon (6 489) ; roach (6 403).

e. **Amphibians** : frog (3 472) ; toad (7 286) ; newt (5 407).

f. **Reptiles** (6 388) : lizards (4-528) ; snakes (7-74) ; tortoises (7 294).

g. **Birds** (1-453).

h. **Mammals** (5 100) :

1. Cattle (2-273) ; horses (4-196) and other hoofed creatures.

2. Rodents (5-103) ; rabbits (6-327) ; squirrels (7-140).

3. Cats (2-261) and dogs (3-100).

4. Mole (5-231) ; hedgehog (4-152).

5. Bats (1 380).

NATURE STUDY ALL THE YEAR ROUND

THERE are no fixed rules for Nature Study. You may begin anywhere, at any time. You may start with the whale and work down to the tiny bacteria, or you may begin at the other end. You may start with animals or you may start with plants, but no matter where you begin if you ask questions about the common everyday things of life you will find yourself very quickly following the fascinating paths through Nature's great garden menagerie. There are two important rules to follow in finding your way through these paths. First, begin with the animals and plants that are near you, those that you can see for yourself; secondly from those that are around you, choose at the outset the animals and plants that you like the best, for love of Nature and sympathy with Nature are essential.

Do not try to do too much. Among the experiments suggested pick out a few and carry them out to the end. If you try to keep four or five different kinds of pets, take care of a flower garden, cultivate vegetables, and make several different collections, all at the same time, you will not do any one thing well and so you will become dissatisfied. Pick out not more than one or two for each season, and leave the others until next year.

While you are at work, always bear these main principles in mind

A All Nature is unified. Every part is connected with every other part. Plants depend on soil and climate, animals depend upon plants or upon other animals. No living thing can ever be entirely independent. Nature Study is the study of the marvellous adjustment of those relations.

B Everything in Nature has a reason. The shape of every leaf, every flower, every seed, the form and colour of all animals, the arrangement of their feet, their teeth, their fur, their feathers, the way every bird builds its nest, the way every creature looks after its young, every detail of structure and habit, large or small, all these things have a reason. Nature Study is the study of those reasons.

Note. Reference to the Nature Notes for each month in the Through the Year Calendar in this volume will be of considerable help in suggesting what creatures or plants to look out for at any particular time. Remember that in general the north of Britain is a fortnight or so later in spring and summer than the south, birds that are summer visitors leave earlier, winter visitors arrive earlier.

SPRING

Spring is the season of birth and awakening after the Winter months of rest. In this section of this Outline, the basis of work for the rest of the year is also given.

I STUDY OF BUDS

A Order of Opening. Examine the trees of your neighbourhood. See which buds open first. Note the effect of a day of brilliant sunshine, a day of rain, a night of frost.

B How the Buds Develop. Gather twigs of beech (1 409) elm (3 236) horse chestnut (4 197) or other trees. Put them in water at home, using a fruit jar or wide mouthed bottle. Place them where they will get plenty of light every day, and watch carefully the development of the buds. See how the tiny leaves were curled in the bud. Note the difference between the young leaves and the young flowers, and if possible make drawings each day.

Note. All good naturalists keep notebooks. A good plan is to have one small, pocket size notebook for "Field Notes," and another larger, loose leaf one for "Experiments." The first will cover what you see on your trips outdoors, the second what you do at home, and rough notes from the first can later be neatly written up and filed in a loose leaf system for reference. Before starting a field trip, try to have some definite plan in mind about what you intend to find and study, and make your notes accordingly. Always put down the date of the trip, where you went and what the weather was like. Do not try to write too much, just the most striking things. In your notes of experiments you should go into greater detail. If you have to make or build anything, describe how you did it. Whenever you get a chance, make a drawing of what you see or do. Drawing is far better than writing, for once you have drawn a thing you will never forget how it looks. Never mind if your first drawings are crude, you will be surprised how rapidly you improve with practice.

II STUDY OF FLOWERING PLANTS

A Flowers. Watch for the appearance of the first spring flowers and note them, year by year. Notice that trees usually bud in the spring before the smaller flowering plants spring up from the ground. Which gets warm first, the air or the ground?

B Collecting Flowers. When spring is well under way you may start to collect wild flowers. But do not uproot rare plants.

a. When you get home with your flowers, how do they look? How does the stem look? Notice that those you carry home in your hand suffer more than those you have kept in a tin collecting box.

b. Now put them in water and watch carefully what happens.

NATURE STUDY

- c. Put a few of the flowers into water stained with red ink or some bright water colour. The next day cut through the stems, half-way up; examine the cut ends. What do they tell you about how flowers drink?
- d. See how many of the flowers you can name with the help of a good book about flowers (see bibliography at end of Study Outlines). Make sketches of one or two in your field notes.

Note. One way of learning about wild plants is to make a collection of dried specimens. Collect the plants when they are dry (not wet with dew or rain). When you arrive home with them, cut off any damaged leaves and lay the specimens, singly, between sheets of clean blank paper (with several sheets above and below each to allow for irregularities of outline). Arrange a specimen neatly on its sheet, cover with other sheets, on the top one of which arrange another specimen, and so on. When the pile is ready for pressing, place on top a flat board and on this four or five bulky books. Change the paper after about 12 hours (not more). Each specimen will need to be peeled carefully off its sheet and as carefully transferred to clean dry paper. This "pressing" paper should always be dried before it is used again. After several changes, the pressed specimens will be dry enough to be transferred (singly) to the mounting paper: foolscap is a convenient size for this. The specimens should be attached to the paper by loops across the stalk of very narrow strips of gummed paper (such as that used for mending sheet-music). On each specimen-sheet write the common and the scientific name of the specimen, the locality where it was found, the date, and any other relevant detail. The collection can be kept in stiff folders. Even the largest herbarium (as such a collection is called) started in this way. It should be noted that a specimen-sheet is not complete without stem (or part thereof), a flower or flowers, and (a later addition) some seeds. A thick stem will need to be reduced by slicing the back away with a razor blade. Seeds (fruit) too large for pressing should be drawn on the mounting-sheet. The root (perhaps a bulb) should also be added or drawn.

III. THE PARTS OF A FLOWER.

- A. The important parts of a flower are the **peduncle** (stalk), the **sepals** and **petals** (combining to form the **perianth**), the **stamens** (each consisting of the **filament** and the **anther** which bears the **pollen**), the **pistil** (which consists of the **ovary** containing the **ovules**, the **style**, and the **stigma**).
 - a. Take a flower and examine it, pulling it to pieces if necessary, and learn to recognize the parts mentioned above. If you are to learn the purposes of things in Nature, it is important to know their technical names, for this will make it much easier for you to think and observe correctly, and to describe things clearly to other people.
 - b. Remember that the primary purpose of every flower is to develop (or help to develop) seed. A fruit is that part of the flower which contains the seed; some flowers, however, are sterile and perhaps serve to attract insects to the less showy, fertile ones of the same species or variety, as in Guelder Rose (*f.-t.*).

IV. SEEDS (6-528).

- A. **Seed Structure.** Get a handful of dry broad beans (1 390). Examine one of them carefully. Notice the small knob on the inner edge. That is part of the **young plant** or **embryo**. Peel off the tough outer hull, called the **seed-coat** or **testa**. Notice how the inside of the bean is divided into two halves, which are united only at the young plant. These halves are called the **cotyledons**.
- B. **The Seed Comes to Life.** Fill a small wooden box with moist soil. Sow a few of the beans a quarter of an inch deep, and mark with a match where each is. Keep the soil moist, but not souden.
 - a. After two days, dig one of them up, and note what has happened to the embryo and the seed-coat. Every other day dig another up very carefully and observe the development of the rootlet (called the **radicle**), of the first small leaves (called **plumules**), of the stem. What has become of the cotyledons?
 - b. Note how long after sowing the first stem appears above the soil. You will see that it is arched; the root end is the anchor, and the other side of the arch is pulling upwards just as hard as it can to free the first leaves.
 1. The cotyledons are simply storage houses for the embryo's food. When we eat cooked beans we are nourished by the food that was intended to give the sprouting bean plant its first start in life.
 2. Here is a simple way of testing this. The food stored in the cotyledons is mostly starch. Iodine turns blue when it touches starch; the more starch there is, the deeper and darker the blue. Keeping that in mind, put a drop of weak solution of iodine on one of the cotyledons, when a bean first starts to sprout. Note the colour. Now put a drop of iodine on a cotyledon after a young bean plant has straightened up above the ground. What change do you notice, and what does it indicate?
 3. An even simpler test is to remove the cotyledons from one of the young plants a day after it appears above the ground, and then compare its rate of growth with that of the others.

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- C. **Differences in Seeds.** Study the seeds of other plants. Sow seeds of onion, lilies, radish, nasturtium, pansy, hollyhock, sunflower, cabbage, pine or fir tree, or any other available kind, selecting a half-dozen as varied as possible in size and shape. Note how each behaves in sprouting. (Be sure to label each group of seeds so that you can identify the seedlings.)

Note. Some seeds have only one cotyledon. This is an important point in the scientific classification of plants, all the most highly developed plants and trees being grouped as either Monocotyledons (with one cotyledon) or Dicotyledons (with two or more cotyledons). The pine, belonging to a lower group (*see* Outline on Botany), has a number of cotyledons.

V. MAKING A GARDEN.

- A. Remember that you, as a Nature student, are interested in the lives of your garden vegetables. Learn to know them all, how they germinate, what their flowers are like, and other similar details.
- B. While you are taking care of the garden, learn the *reason* for everything you do. Why should the soil be dug and made fine before sowing seed? What harm do weeds do? What are the chief enemies of your garden, besides weeds?

Animals and plants are intimately connected in Nature. Where there are no plants, there can be no permanent animal life, for plants are the original manufacturers of all food, and animals live upon this food, directly or indirectly. If some are able to exist as flesh eaters, it is because they live upon others which eat vegetable food. It follows, therefore, that the structure and habits of all animals are closely associated with the character of their plant neighbours.

VI. FAMILIAR PETS.

Note. Begin your study of animals with those nearest to you. Such studies are intended to bring out some of the most striking points in the bodily structure of these familiar animals, points which you might perhaps overlook, but which illustrate the great fundamental law of *natural fitness*. By the use of intelligence, men train themselves to be fit for special tasks. But the fitness of animals for the many different lives they lead has been developed through untold ages by Nature. During the long time that Man has been breeding domestic animals to suit his own needs, these animals have changed greatly in appearance, but they retain most of the forms, instincts, and habits that were so useful to their wild ancestors. A study of these forms and habits, therefore, will be most useful in helping you to work out problems of wild life.

A. Dogs and Cats.

Examine a Dog and a Cat. Observe the extraordinary length of their eye-teeth or "canine" teeth, characteristic of the carnivorous or flesh-eating animals. Does a cat behave in the same way when you give it a saucer of milk as it does when you give it a piece of meat? In the same way, note the differences in the general build of a cat and a dog, their claws, eyes, fur, etc., in relation to their different mode of life.

B. Other Pets.

Examine the front teeth of a rodent (5-103) such as a rabbit (6-327), guinea-pig (4-105), or mouse (5-288). How do they differ from the teeth of the cat and dog?

- C. **Bird Pets (2-207), and Poultry (6-277).** Gather as many interesting notes as you can about the habits of bird pets, such as canaries and pigeons, and farmyard poultry. How do birds get along without teeth? How do the beaks of one species differ from those of another in relation to their food? Notice the arrangement of their claws. Notice particularly how bright and active little chicks are as soon as they break out of the egg. Compare them with young pigeons. Remember that chickens are descended from birds that nested and spent most of their lives on the ground, where the young, if they were not alert from birth, would be at the mercy of every chance foe. Pigeons, on the other hand, are descended from birds that built their nest in high, inaccessible places, where the young were comparatively safe.

VII. FARM ANIMALS : Horse (4-196) ; cattle (2-273) ; sheep (7-20) ; pig (6-196) ; goat (4-37).

- a. **Watch these animals when they are feeding.** See how they gather up the grass. Do they stop to chew? Watch them when they are lying down after feeding. What are their jaws doing? Are they chewing the cud?—a remarkable habit. Read about it in the article on Cattle. Do horses or pigs "chew the cud" in this fashion?
- b. **Notice the feet (3-412 ; 5-102) of these beasts.** How many toes have they? Look again and see if you can see two more. Nearly all Mammals, except elephants, bears, monkeys, Man, and a few other groups, *walk on their toes*. Some walk on one toe, like the horses, some on two toes, like the cow; some on four toes like the cat and dog. In each of them, traces of the remaining toe or toes are to be found higher up on the leg. The

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- "hock" on the hind leg of a cow or horse is really the heel, while the "stifle" is the knee. What we call the "knee" on the front leg is really the wrist.
- c. Examine the teeth of cattle, sheep, pigs, and goats. Remember that the organs for eating and moving usually indicate the habits of animals.

VIII. WILD BIRDS (1-453).

A. Bird Diary.

Right at the beginning of the year you can start a bird diary, for British resident birds are moving, singing, and building their nests long before summer visitors begin to arrive. Notice, too, the movements of the big flocks of starlings, finches, and other birds, as well as those of winter visitors. In later spring, you will be kept busy with notes on the arrival and departure of various migrants. Observe when various species start to sing, when they get their breeding plumage, when and where they first begin to build. A bird diary, even if your activities are confined to one small garden, may have several entries for every day of the year.

B. Nest Boxes.

Build small bird-boxes. Place them fairly high up on big trees, not too close to the house. Keep a good watch on them and note which birds use them or inspect them, when they begin to build, etc. Be careful not to disturb them by going close too often, and resist the temptation to look inside and see what is going on! A pair of field-glasses or a small telescope will help you to observe birds at a distance that does not disturb them.

C. Field Notes on Birds.

- a. Watch for birds' nests on your field trips. Note the position of each with small sketch maps in your notebook, so that you can return from time to time to watch the progress of the feathered families. Notice the size, shape, and colour of the eggs. Do not yield, however, to the temptation to collect birds' eggs. A blown egg in a box at home soon becomes uninteresting; but an egg left untouched in the nest will quickly turn into a young bird. Do not, moreover, visit any nest more than once a week, or the parent birds may desert it. When the young have gone you can examine the nest and note the materials of which it is made.

Try your hand at sketching some of your favourite birds. Make sketches from your *personal observations*. There is little profit in copying someone else's drawings. Try filling in the outlines of the sketches with water colours.

- c. Learn to identify birds by their song and their manner of flying as well as by their shape and colour. Use a good book for this.

IX. THE LIFE OF STREAM AND POND.

A. The home aquarium (1-187).

One of the most delightful ways of studying Nature is to keep an aquarium at home. You might begin modestly with a small fruit jar, or you can buy a small glass tank, or build yourself an oblong aquarium with plate-glass sides cemented into a wooden or metal frame.

- a. Plants for the aquarium. Cover the bottom of your aquarium about one inch deep with clean sand. Go to the nearest pool or stream and gather small water-plants, taking a little of the mud or stones on which they are growing. Read the article on water-plants (7-429), and try to identify all the plants you collect. Arrange them in your aquarium, and leave alone for a few days.

- b. Animals for the aquarium. Gather in a net or in glass jars any of the water creatures you find in the same place as you found the plants. For this purpose, a shallow net of strong netting, stretched on a cross-stick frame, will do very well. Just comb it through the water-plants or along the muddy bottom.

1. Get some water-snails, some of the smaller water-beetles and other insects. A few will be enough to start with. If you find in your net strange insect-like creatures that you cannot identify, place them with a few plants in separate jars. They are probably insect larvae, such as the larvae of dragon-flies (3-112), which are very fierce and would kill your other captives if placed in the same aquarium. Later you can add small fish to the collection.

2. If the water in your aquarium tends to become cloudy, change it and try putting in a few more, or taking out a few, plants, and watch the effect. Experiment until the water remains clear without changing. Such an aquarium is said to be "balanced," the plants providing the oxygen that the animals need, and the animal the gas (carbon dioxide) that the plants need. Water-snails are especially useful for keeping the water and the glass clear. (Read the article on respiration, 6-389.)

3. Cover the aquarium with cloth netting or a wire screen to prevent such insects as water-boatmen from flying away. Always keep the water cold. Do not let direct rays of the sun shine on the aquarium.

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- c. **Raising Frogs and Toads.** Go to a pond where there are frogs (3-472) or toads (7-286), and collect their jelly-like spawn. Place these egg-masses in an aquarium, and watch them develop. Note carefully the stages through which each egg passes.

SUMMER

In summer you continue your general Nature observations and notes, always bearing in mind that now all animal and plant life is growing, developing to maturity, preparing for the fruition of Autumn.

I. PLANTS AT WORK. Review in detail the article on plant life (6-214).

A. Leaves (4 469). Read this article carefully.

- a. **Start a Collection of Leaves.** Follow the detailed directions given for the flower collection (8-161, 162). Be sure to identify each leaf, noting the principal points that distinguish it from other kinds of leaves.

Note : Remember, in looking up the names of plants and animals, that they often have different popular names in different parts of the country. If you cannot find a certain name in your Nature books, consult a good dictionary, and you will possibly find that the plant or animal in question is more widely known under some other name, which will be the one used in your books.

- b. **Leaves and water.** Suspend a drinking glass mouth downwards over a well-watered growing plant, so that some of the leaves are imprisoned inside the glass. Cover the soil with oiled silk. Leave it overnight. What do you find on the inside of the glass in the morning? Where did it come from?
- c. **Leaves and light.** Place a house plant, for instance the so-called geranium (3 524), in a room that has only one window. Examine it a week later. Which way are all the leaves facing? What must you do with a potted plant to make it keep its shape in such a room?
- d. **Leaves and their work.** If the leaves are stripped from a plant it will stop growing, and if the stripping continues for long, the plant will die. Why is this? Notice that when there is a bad attack of defoliating caterpillars such as those of winter moths, trees may be so weakened that they are attacked by other pests; if this happens several years running, the trees may die.

1. Crush a leaf in your fingers. Can you see the green colouring matter (chlorophyll) separating itself from the pulp?
2. What kinds of plants can you find that are not green? Read the articles on fungi (3 488), mushrooms (5-301), and look at 6 215, illus. of toothwort. Do you know now why mushrooms can be grown in dark cellars, where green plants would die?

B. Flowers (3 395).

- a. Select a few common flowers for study. Identify the different parts of each flower, as you did when working on spring blossoms.
1. Touch the anther at the tip of the stamen in one of your flowers with your moistened finger. Note the fine yellowish dust that comes off. That is the pollen.
 2. Read the section on the parts of a flower (8-162). Now cut your flower open carefully and see if you can find the parts there described.
- b. Go out in the evening and notice how flowers go to sleep at night (see 6-218 illus. of water-lily).

Note : An evening or night walk is full of interest at all times. Watch for flowers that are open, for bats (1-380), glow-worms (4-36), and many moths. Listen for birds that sing or cry at night, for instance the nightjar (5 438) and the owl (6-11). If you are quiet you will hear all sorts of animals moving.

II. POLLINATION OF FLOWERS (3-396, 399, 400).

The fertilising pollen is carried from the male anthers to the female stigmas in various ways. While it would be possible for many flowers to fertilise themselves, Nature in general avoids this, arranging for cross-fertilisation whenever possible; indeed, cross-fertilisation is essential if the race is to continue strong and vigorous. Many flowers are therefore of one sex only, bearing either stamens or pistils, but not both. In some trees this is most noticeable: thus you often see a holly tree that never bears berries, although it flowers frequently. Make a note of such a tree and examine its flowers in spring: they are all males. Cross-pollination is brought about in various ways. If the anthers ripen first, the plant is said to be protandrous; if the stigmas ripen first, it is protogynous.

- A. **Insect pollination.** You can see this by examining almost any flower that attracts insects. Notice that when a bee enters the flower, it brushes against the anthers, collecting some of the yellow pollen (often it has gone to the flower expressly to collect pollen to make "bee-bread," 1-405, to feed its grubs on). The pollen on the bee's legs or back rubs against the sticky

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stigmas of the next similar flower visited by the bee, and fertilisation is ensured. Some orchids are fertilised by moths which take away the whole pollen-sac, called a "pollinium," and if you examine the heads of these moths you find such sacs sticking to them. Some flowers are pollinated by one species of insect only.

- B. Wind pollination.** Notice the masses of yellow dust in the pine woods. This is pollen, blown from the curious catkin-like male flowers, and floating about until it comes to rest on a young female cone (3 484). Most conifers and other big trees are pollinated in this fashion; so are early flowering trees, such as cherries, which bloom before insects are about. But they also bloom before there are any leaves, and their petals open exceptionally wide, giving the pollen a better chance of reaching the stigmas.
- C. Other Types.** A few plants are water-pollinated, the pollen being floated on the surface of pond or stream; these are, of course, water-plants whose blooms are close to, or on, the surface. Some tropical species are pollinated by small birds such as humming birds. Self-pollination occurs in early flowers such as crocus (2 533), narcissus, etc., and may occur in others if they have not been visited by insects, the anthers bending inwards to the stigmas in the later blooms.

III. SEED PRODUCTION : the transformation of the flower into fruit (3-480) and seed (6-528).

- a. Watch a flower as it fades and note what happens to the various parts. Remember that from the point of view of the plant, the purpose of the flower is simply to produce the seed.
- b. Make notes of the seed development on the trees and other plants of your neighbourhood.
- c. Find how flowerless plants, like ferns (3-346), mosses (5 167), and liverworts (4 526), reproduce themselves.

IV. WHAT PLANTS NEED FOR LIFE.

A. Light.

Sow half a dozen French beans in a box or flower-pot and put it in a dark place. Give the seedlings the water they need. Note how they differ from others raised in the light.

B. Water.

Sow three separate colonies of French beans. Keep one colony soaked with water; keep the second colony moderately damp; and give the third colony no water at all. Compare the results.

C. Air.

Sow some French beans inside a fruit jar and keep the top screwed on tightly. You will not have to water them, since no water evaporates. Watch what happens.

D. Minerals.

Besides the article on plant life (6 214), read also that on soil (7-83).

V. INSECTS AT WORK.

- A. What is an Insect (4-264)?** Be sure you know one when you see it. Is a spider (7-132) an insect?

B. Social Insects : Ants (1-160); bees (1 405); wasps (7-420).

- a. **Studying Ants at Home.** Get a large fruit jar and fill it two-thirds full of moderately damp earth—a soil containing a fair amount of sand is best. Find a nest of ants, any one of the smaller species that build in the ground, and capture its inhabitants. A good way to do this is to scoop up the whole nest with a garden trowel and put it, ants and all, straight into the empty jar. Be careful not to injure the ants, or the larvae and pupae. The larvae are tiny white grubs, the pupae are like grains of rice. Also search carefully for the queen, which you will recognize by its greater size.

1. Transfer all your captives to the jar you have prepared, and fasten over the top a fine screen or a paper punched full of pin holes. Now make a cylinder of heavy black or dark brown paper which will fit snugly round the outside of the jar, yet be free to slide up and down. Put a little sugar, some bits of raw apple, or some tiny pieces of meat in the jar, and place it for a few days in a corner where there is not much sun.

2. After some days, slide the paper cylinder down, and you will find the ants have made galleries down the sides, just inside the glass. They have taken advantage of the fact that the glass offers them support for one side of their tunnels. You may watch the structure of the tunnels for a few minutes, but do not leave them exposed to the light too long, or the ants will abandon those tunnels and dig out of sight.

3. Make notes on the way the ants work, how they eat, how they look after their young etc. New larvae and pupae of the same species will be welcomed, cared for, and brought up most carefully. If at any time the soil seems to be drying up, scatter a few drops of water inside the jar. Feed the ants from time to time on fruit or meat.

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- b. **Field Work on Ants.** Dig carefully into and examine the nests of different sorts of ants, capturing specimens of the inhabitants and identifying them.

The nest of the big wood ants is the easiest to study. Some way from the nest you will find a trail leading inwards and outwards, with a stream of workers moving along it. In the nest itself, if you can pluck up courage to sit down and really examine the inside, you may find some beetles and other insects that are the "guests" of the ants, secreting "honey-dew" for the ants' benefit and being fed in return. Some of these guests are also scavengers in the nests. Other ants live beneath the bark of trees, under stones, or in old masonry. Look, too, for the ants that "milk" the aphides or greenfly (1-182) on garden plants—especially the roses—and notice how carefully they look after these "cows." When the hot, sultry, thundery weather comes in mid-summer, watch the mating flight of the male and female ants, and how the winged forms break off their wings when this flight is over. Notice that this flight always occurs during certain weather conditions (generally close and thundery).

C. Insect Transformation (4-265).

- a. **Caddis Flies.** To study these you will require an aquarium as described above, page 164. Go out to the nearest pond or stream and examine the shallow water near the edge. If you look long enough you will probably see some small bundles of criss-crossed sticks and bits of stone, which move about in a mysterious way. Scoop a few up and carry them home in a jar of water, and put them in your aquarium. They house the larvae of Caddis Flies (*f.i.*). In time these larvae turn into pupae and then, a little later, they will emerge from the water as adult, four-winged flies.

- b. **Caterpillars (2-263).** Find caterpillars of various types. Take them home and keep them in a well-aired tin, or a box one of whose sides is covered with zinc-gauze or muslin. Keep them on sprigs of the tree or plant on which you found them, and renew these sprigs daily. See that the caterpillars get plenty of light, but no direct sunlight. Clean the box each day, removing all the food but that upon which they actually are. They will crawl of their own accord on to the fresh food. Do not touch the caterpillars if you can help it. When they are full-grown after changing their skin several times, see that there is an inch or two of earth in the bottom of the cage or box, also bits of bark. If you can identify the caterpillars, you can find out where they will pupate. Some go underground, others make a silken cocoon in a corner of the box, others weave leaves together. Some will emerge as adults this year, others may wait until next spring. If you have a male and female adult of the same sort, they may mate and you will then be able to breed more from their eggs.

VI. BIRD LIFE.

- A. **Summer Activities.** Continue your spring-time notes, with especial reference to the young of the birds you have seen arriving. Notice their plumage, its differences from that of their parents; observe how the parent birds stop singing and begin to moult after the breeding season. Ducks (3-130), for example, go into an "eclipse" plumage.

B. Feathers (3-344).

- a. Examine all the feathers you can find. Cut up a feather, examine the quill. Pull apart the "barbs," which make up the flat part or "vane" of the feather. Examine the structure of these barbs through a magnifying glass.

AUTUMN

Autumn is the season of fruitfulness. Plants, which have reached maturity or gained new vitality in the summer months, now put forth their seeds and fruit. New generations of animals are growing up. All Nature is busy preparing for Winter.

I. SEEDS AND SPORES (6-528).

- A. **Seeds and Fruits :** Make a collection of seeds, or observe and draw those of all the plants you can find in your neighbourhood. Note how the seed-containers are attached to the plant, and see how each is adapted to distribution—

- a. **By Wind :** Observe fruits of the ash (1-263), sycamore (7-215), and pines (6-203).
b. **By Animals :** This happens in two ways. Notice the burrs of burdock (6-529 illus.)—these catch in the fur of passing animals, and the seed is thus carried to a distance. "Fruit" is simply pulp enclosing seeds; it attracts animals as food; the animals swallow the seeds and excrete them far away from the parent plant.
c. **By Birds,** for example, mistletoe (5-228) and yew (7-513).
d. **By Water :** Alder (1-97) seeds are dropped over streams, and float to a resting (and rooting) place.
e. **"Mechanical" distribution :** Seeds of hairy bittercress (1-477) and some other plants are expelled violently from their pods to a distance of a foot or more.

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B. Spores :

- a. **Ferns (3-346) as Examples of Spore-bearing Plants.** Examine the under side of fern fronds until you find one with many little brown or black dots. These are the "spore cases." What is the difference between seeds and spores? Do ferns have flowers?
- b. **Mosses (5-167) and Liverworts (4-526).** Note the differences between them and the ferns.
- c. **Fungi (3-488) and Mushrooms (5-301).** This is the great season for these parasites and saprophytes. Notice the different types of fungi, the way they grow and how they spread. Examine "fairy rings" (3-339). Make a collection of the special insects found in connexion with these fungi.

II. HOW PLANTS GROW.

A. Trees (7-308) as Examples of Growth.

- a. **Examine a Tree Stump.** Note the rings in the cut surface of the wood. You can tell the age of the tree by counting those rings. Which is harder and tougher—the heart-wood near the centre or the sap-wood near the bark? Peel off the bark and try to identify the cambium.
- b. **How Sap Circulates.** In summer or spring, select on a growing tree a small branch that can be destroyed without harming the tree. With a sharp knife cut off a narrow ring of bark, so as to leave a bare strip completely encircling the small branch. Be sure you cut through the cambium to the woody fibre. Now watch that branch daily. Before long it will die from the ring to the tip, for the circulation of the life-giving sap has been stopped.
- c. **Autumn Foliage.** Notice when the leaves in your neighbourhood begin to change colour, and observe the order in which they change, and fall. Gather leaves from the different trees of your neighbourhood after they have changed colour, and put them with the summer leaves in your collection.

B. Roots (6-451) and Their Work (6-216 illus.).

Dig up any small plant, taking plenty of soil with it. Now wash off the soil carefully so as not to injure the roots. Examine the fine root-hairs.

- a. Read about the remarkable process of root pressure (6-216), and if possible perform the interesting experiment shown in the picture.
- b. Next read the article on soil (7-83).
- c. What are the underground parts of plants besides roots? Read the article Bulb (2-118), and plant examples of the various plant storage organs in pots indoors, setting them aside until the winter or spring—crocus corms, narcissus bulbs, tubers of potato, Solomon's seal rhizomes.

III. ANIMAL STUDIES.

A. Spiders (7-132) and Their Webs.

- a. Notice the different types of web and their owners. Agitate a big "orb" web by moving a blade of grass against it. Watch the behaviour of the spider. Make a drawing of the web pattern. Now poke a hole in the web with a stick. Come back the next day, and you will probably find the web mended. Notice by comparison with your drawing how the patch was put in.
- b. Notice the difference between the spiral threads and the courser cross-threads of the web. Why are some elastic and others rigid?
- c. Study beneath a lens the remarkable structure of a large spider and note especially ways in which it differs from insects.

B. Snakes (7-74); Lizards (4-528).

Remember that there is in Great Britain only one species of poisonous snake—the adder or viper. The other snakes are harmless.

- a. You may examine a grass-snake (4-65) without fear. Note the absence of eyelids. See how the scales on the under side are arranged so that they catch in the ground and help the snake to pull itself along. You can feel the scales pulling if you let the snake crawl over your hand.
- b. Try to catch a slow-worm, or a legged lizard. These make interesting pets and are not difficult to keep in captivity. Compare your slow-worm with a snake; you will see that they are quite different.

IV. ANIMAL PREPARATION FOR THE WINTER.

A. Storing Away Food :

- a. **Outside Storage.** Watch a squirrel during the autumn months. Throw nuts where it can find them, and try to see what it does with them.

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- b. **Inside Storage.** If you can catch a hedgehog (4-152) or a dormouse (3-107) in the autumn, notice how very fat it is. It is storing its winter's food inside its body in the form of fat.
- c. **What other animals do you know that hibernate (4-173) ?**

B. Migration (5-202).

- a. **Birds.** Watch during the autumn months for the southward migration of birds. What kinds leave your neighbourhood ? Note when you last see them. Notice, too, that some sing a little before leaving, while others are silent. Discover what kinds pass through your neighbourhood from the north—these are "passage migrants."
- b. **Other Types of Migration :** eel (3-170 ; 5-202) ; salmon (6-489 ; 5-202).

WINTER

This is the season of rest. Most of Nature lies dormant awaiting the call of Spring to burst forth into new life. But for those animals which neither migrate nor sleep through this season Winter is often a period of hard struggle and hunger.

I. PLANT LIFE IN WINTER.

A. Evergreens (*f.i.*).

- a. **Conifers (2-483).** Make a list in your notes of all the cone-bearing trees you can find and identify in your neighbourhood ; notice and draw the arrangement of the needles, the form of the cones, and the shape of the tree as a whole. Notice that some cone-bearing trees shed their needles in the winter (*e.g.* the larch, 4-447).
- b. **Other Evergreens :** laurel (4-455) ; holly (4-187) ; holm oak (5-490).

B. Trees that Lose Their Leaves (deciduous).

- a. **Bark Formation.** Winter gives you an opportunity to learn to know trees by their bark. Study the trees of your neighbourhood until you can recognize them in this way. In your leaf collection make sketches of the bark of the tree to which each leaf belongs.
- b. **Arrangement of Branches.** Note that nearly every species of tree has a shape and arrangement of branches different from others. An interesting experiment for winter field trips consists in guessing the names of trees from a distance, judging merely from the appearance of the branches against the sky, then verifying them by closer inspection of the bark or twigs.
- c. **Twigs.** The examination of the twigs is a sure way of identifying trees in winter. Notice that some twigs—for instance, those of the walnut (7-416), birch (1-452), and hazel (4-143), now bear the young, tightly-closed catkins of next year's flowers, while others still bear bunches of fruits (hornbeam, 4-195).

- C. **Winter Sleep of Plants.** Learn to distinguish annuals, biennials, and perennials (6-218). Note that nearly all plants whose *seeds* are used for food are *annuals*, for example wheat, oats, beans, peas. Nearly all plants whose *roots* or *leaves* are used for food are *biennials*, for example, carrots, turnips, beets, cabbages. In annuals the parent throws all its strength into the seed and then dies ; in biennials the first year's strength is thrown into the production of root, stem, and leaf.

II. ANIMAL LIFE IN WINTER.

Although certain animals are asleep (or hibernating), many others are about, and there is ample opportunity to observe these.

- A. **Deer (3-59) and other Mammals.** The antlers of red deer, common in parks all over Britain, are at their best. In autumn the deer "rutted," fighting fiercely for the collection of hinds that now follows each one meekly about. Roe deer, on the other hand, have mated already, and the bucks have lost their little pointed horns. If there is snow, you can find tracks of animals : foxes, cats, dogs, rats, weasels all leave characteristic footmarks, which you can learn to recognize with a little practice. Make drawings of each type of track and, if possible, add the measurements between the footmarks in every direction so that you can gauge the size of the animal.

B. Birds.

- a. **Winter Visitors.** Birds also leave tracks in the snow, and this gives you a chance to see the different ways in which they move on the ground. Thus, rooks (6-499) walk, members of the thrush (7-271) tribe hop, wagtails (7-409) run. Sea-birds such as gulls (4-105) come inland and leave strange markings with their webbed feet ; the curiously leaf-like toes of the moorhen (6-353) also make a very distinct track.

Then there are the winter visitors ; go to your nearest large pond and see how many kinds of duck (3-130) you can find. Notice that they are as easy to distinguish in flight

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as on the water. Rare birds from the far North may be seen here, too; and all sorts of unusual wading birds (7-408) visit the mudflats on big marshes.

- b. **Flocking and Small Migrations.** Notice how many common birds gather into big flocks in winter. Finches (3 352), starlings (7-151), and green plovers (6-226) are the most noticeable, unless you live near the sea, when flocks of waders are conspicuous on the shore. Coots (6-353 with illus.) form big congregations at this time of year. There are all sorts of interesting small migrations to be watched even among the common birds of the garden. Thus, robins, thrushes, and other birds are much bolder when hunger drives them, and species not usually seen in the garden may put in an appearance at the bird-table. Put out a good supply of food of all sorts: but make sure to put it where cats cannot reach it or get at the birds.

c. **Insects.** Many insects rest in the winter, often in an immature stage. On the apple trees, for example, you may find the eggs of the lackey moth (*f.v.*) laid in neat bands round the twigs; on other trees are other eggs, while every cranny of the garden shed may shelter a chrysalis or cocoon, from which in the spring you can rear the butterfly or moth. If you dig an inch or so down beneath big trees, such as oaks, you will find more pupae. Beetles, wood-lice, and many garden pests are ever active, while a few butterflies come out on any warm sunny day. After the New Year, start looking out for their first appearances for your new Nature Diary. Remember that Nature's year has little to do with that of the calendar, and your new diary may well be as full of entries in December, January, and February as it will be in spring and summer.

Interest-Questions in Natural History

- "It has a beak like a duck, hair like a cat, and a tail like a beaver. It has four legs and web feet. It lives both on land and in the water, lays eggs and hatches them like a bird, but feeds its young with milk." What is it? 3-133
- What fish are hatched in a pouch in the male parent's body? 6-524.
- Certain plants have the power of eating insects: do you know the names of any? 6-218 illus.
- Some plants have poisonous properties: can you name any? 6-236.
- What animal spends nearly its whole life upside down? 7-68
- How are certain animals able to live all winter without food? 4-173.
- How do water spiders get air into their nests at the bottom of ponds? plate f. 5-335 7-134.
- Does the flying squirrel really fly? 7-140
- How can you tell butterflies from moths? 2-136.
- What animal takes its little ones riding on its back? 5-111 illus.
- What happens to insects in the winter time? 4-269
- Why do plants grown in the dark remain white? 6-217.
- Which animals walk on their toes? 3-412.
- Why do leaves change colour in the autumn? 4-472
- What reptile runs on its hind feet like a man? 4-528.
- What makes most plants green? 6-215
- Where do earthworms spend the winter? 3-153 illus.
- What is caviare? 7-174.
- Why are birds' eggs variously coloured? 1-458.
- Why do many water plants have long slender leaves? 7-430
- What animal of the United States carries its young in a pouch, as the kangaroo does? 5-521.
- What use has the camel's hump? 2-184.
- Does a plant get most of its food from the soil or from the air? 6-217.
- What does a bird's foot tell you about its habits? 1-471 illus.
- Are whales fish? 7-445.
- What insects sometimes travel in such clouds that they darken the sky? 5-14.
- Can cats see in total darkness? 2-202.
- Do male birds ever hatch eggs? 1-460
- How far can a lion travel at one bound? 4-520.
- How do flowering plants breathe? 6-215.
- What birds have a "third eyelid"? 1-454.
- What fish sleep through the dry season in balls of mud? 5-51
- Which insect looks after its offspring after they have hatched? 3-154
- How tall do bamboos grow? 1-359
- How can you tell the age of a colt by its teeth? 4-196
- What common coniferous tree sheds its leaves in winter? 4-147
- Are sponges plants or animals? 7-137.
- What is the only class of animals that grows hair? 5-100
- What insect defends itself with "poison gas"? 1-114
- What is the largest land animal that ever lived? 3-225 The largest sea animal? plate f. 7-146
- What is the largest creature that has ever flown? 6-281
- How do insects breathe? 4-264
- What gives butterfly wings their beautiful colouring? 2-130
- Was there ever a bird with teeth? 1-453 illus.
- What are the ants' "cows"? 1-162
- Why are a bird's bones hollow? 1-453
- Why should an aquarium contain plants as well as fish? 1-144
- Can fishes hear? 3-377.
- Why does the ant-lion dig holes in the sand? 1-178.
- What purpose is served by the colour and fragrance of flowers? 3-400.
- What makes it possible for a fly to walk on the ceiling? 3-401
- Why do beavers build dams? 1-400.
- What birds lay their eggs in other birds' nests? 3-7.
- What insect lives 17 years underground? 2-387.
- Why do whales "blow"? 7-445
- What animal absorbs its tail as it grows? 3-472 illus.
- How does a grasshopper "sing"? 4-65 A cricket? 2-531
- What group of plants lives entirely on food manufactured by other plants and animals? 3-489
- Do both male and female mosquitoes bite? 5-271.
- To what use does the giraffe put its long legs and neck? 4-22
- What is the importance of the glow-worm's light? 3-388.
- Was there ever such a creature as a flying reptile? 4-36 illus.
- Why are coconut palms found in so many parts of the world? 3-411.
- What is the "sensitive plant"? 6-217 illus.
- What tree has roots springing from its branches? 1-365.
- What lizards look like snakes? 4-528
- What are "anti-guests"? 1-163
- Are the flat-fish's eyes on top of its head? 3-377.
- Where do hermit crabs live? 2-523 illus.

PAINTING

PAINTING (6-33) and the closely allied art of drawing (3-123; see also 8-153) are the oldest arts practised by human beings. Used by prehistoric Man on the walls of his cave-dwellings to depict the animals he knew and to record aspects of his way of living, painting came to be used in Europe chiefly, at first, for the representation of religious ideas and figures; only gradually did it branch out into portraiture, landscape, and still life. In the Orient, on the other hand, landscape was the favourite subject.

I. PRIMITIVE.

Stone Age (2-282; 7-161). Spirited paintings done in three colours on the walls of caves, often with incised outlines, give evidence of the adroitness of hand and keenness of observation of the men of the Old Stone Age (2-279 illus.; 5-105 illus., 109 illus.).

II. DEVELOPMENT IN THE WEST.

A. Egyptian (3-194, 195, 199 illus.; 6-33). Paintings intended not only to decorate walls, but to furnish historical records; conventionalised and symbolic figures often done in brilliant colours which were decorative but not realistic.

B. Babylonian and Assyrian (6-33). Human figures less conventionalised, but also less spirited; animals more truly portrayed than by Egyptians.

C. Aegean (1-24 illus.). Aegean art showed extraordinary power and vigour, less knowledge and accuracy than Egyptian, but greater artistry; animals and plants delightfully rendered.

D. Greek and Roman (4-89; 6-33, 440).

a. **Greek.** Ancient writers tell of the fine work of Polygnotus (4-89), the reputed founder of Greek painting; of Zeuxis; Parrhasius (*f.i.*); Apelles (*f.i.*); and others; but their works have perished. Only vase-paintings (4-77 illus., 78 illus., 89 illus.) remain to illustrate Greek skill in painting.

b. **Roman.** Roman painting, too, is lost, except for murals preserved at Pompeii (6-445 illus.) and elsewhere. They show that the art of the Augustan Age gave local colour, natural flesh tints, and rounded modelling to figures. Although Greek art was their model, it is believed that the Romans developed considerable originality in painting. Mosaic work (1-9 illus.) reached a high standard, especially in formal design, and this influenced later work.

III. EARLY CHRISTIAN PAINTING AND ILLUMINATION.

A. Roman Christian (6-33). From crude religious decorations painted by persecuted Christians on the walls of the catacombs (2-379) and later on walls of churches, a really distinct style in mural painting evolved (4-317).

B. Byzantine (2-150; 6-33). Stiff and inexpressive but richly coloured paintings and illuminations of religious books overlaid with gorgeous conventional ornament. Byzantine

art influenced illumination, especially in Eastern Europe.

C. Medieval and Gothic. A period when the painter, as a rule, was an artisan using his skill in following the instructions of the clergy who ordered religious paintings and dictated costume, pose, and composition. In France (3-439), a good deal of fine painting was done, and doubtless there were artists at work all over Western Europe.

D. Illumination (5-116). This art had great influence on European painting and must be considered with it. The Byzantine and Irish Romanesque schools first reached high standards; later came those of France (3-439; 5-199); Flanders; and England. Through miniatures (2-3), illumination influenced both portrait painting and book illustration.

IV. ITALIAN SCHOOLS.

During the Renaissance, painting flowered in Italy (6-386) as it has done nowhere else in the world.

A. Florentine School. These artists were the first to paint from Nature; they acquired also the mastery of perspective (6-135; 3-123) and developed technique in painting.

a. **Early Renaissance (14th century or trecento).** Cimabue (4-21, 317), a half-legendary figure, and his great pupil Giotto (4-21, 317, 6-386), who is looked upon as the founder of the Florentine School, stand at the dawn of this period. Among the greatest of the "Giottoesques" was Andrea di Cione, called Orcagna (4-317); those early painters all worked in tempera or fresco (6-386).

b. **Later Renaissance (15th, or quattrocento, and 16th, or cinquecento, centuries).** Fra Angelico (4-317); Masaccio (4-317); Botticelli (2-25; 4-323 illus.; 5-67 illus.); Andrea del Castagno (4-318); Fra Filippo Lippi (5-66; 4-318); Uccello (4-317, 322 illus.); Verrocchio (4-318, 483); Ghirlandaio (4-318; 5-190); Fra Bartolommeo (*f.i.*); Andrea del Sarto (6-386, 4-320 illus.); these are some of the great Florentine names before the school reaches its climax with the work of Leonardo da Vinci (4-482; 1-184 illus.; 5-47 illus.) and Michelangelo (5-190).

B. Sienese School (4-317). This school, taking a good deal from Byzantine art, started as early as that of Florence, which it perhaps surpassed in poetry and tenderness. Early in the 15th century it had already begun to decline.

C. Venetian School (4-318, 319). Neither the exquisite Florentine line, nor the intellectual

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mysticism of Florence, but sumptuous, vibrant colour that reflected the gay and brilliant life of the Venetians marked the painting of this school.

a. The Great Period : Carpaccio (4-318); the brothers Gentile and Giovanni Bellini (4-318, 326 illus.); Giorgione (4-318; 2-18 illus.); Titian (7-282; 6-155 illus.; 4-324 illus.); Veronese (4-319, 325 illus.); Tintoretto (4-319; 6-386).

b. Later Masters. The Venetian was the longest lived of all Italian schools, for after its great period came a revival under Tiepolo (4-319), the greatest baroque decorator; Canaletto (4-319); and Francesco Guardi (4-319, 325 illus.), who worked till almost the end of the 18th century.

D. Umbrian School (4-318). The heir of the Siennese School produced an art full of freshness and poetry, yet limited and childlike. Its masters were Piero della Francesca (4-318, 319 illus.); Perugino (4-318; 6-363); and Pinturicchio (4-318).

E. Raphael (6-363) and the Roman School (6-440). The work of Perugino's great pupil, Raphael (*see* illustrations: 3-520; 4-321; 5-68, 445; 6-385), was divided into three periods: Umbrian, Florentine, and Roman. At Rome he became head of a school where his successor Giulio Romano or "Jules Romain" (5-299) was an able and prolific imitator whose work marks the beginning of Italian decadence.

F. Other Schools and Masters. In the late 16th century Padua produced a mighty genius, Mantegna (4-318), whose work had a marked influence on Venetian art; the glory of Parma was Correggio (4-320; 6-386); and many other towns produced lesser masters. The Bolognese or Eclectic School was one of incipient decadence; its masters were the Carracci (4-320); Domenichino (4-320); Guido Reni (4-320; 1-310 illus.); and Guercino (4-320). The Naturalist School was led by Caravaggio (4-320), with interest in chiaroscuro and foreshortening, and the Neapolitan landscape painter, Salvator Rosa (4-320).

V. THE NETHERLANDS AND GERMANY.

Northern artists pursued no visions of ideal beauty; they painted the world around them, and their art is influenced in manner by religion and in technique by the sister arts of illumination and miniature.

A. Flemish School (5-381, 6-34). Minute detail, rich colour, and homely dignity characterise this art.

a. Early Workers. These evolved a school which rapidly became the equal of contemporary Italian work: the Van Eycks (7-380; 5-381 illus., 386 illus.), who gave oil painting new life; Memling (5-381, 382 illus.), painter of religious masterpieces; Patinir (5-381), first landscape artist; Roger van der Weyden (5-381), Quentin Matsys (6-34; 5-381); the Brueghels (2-97; 1-95

illus.); and Mabuse (6-381), through whom Italian influence came in.

b. Later Masters. Still keeping their native originality, these men profited by study in Italy: Rubens (6-468; 1-15 illus.; 5-387 illus.; 7-506 illus.), most exuberant of great masters; his pupil, Van Dyck (7-379), who with Kneller (3-259; 5-132 illus.) and other portrait painters greatly influenced English painting; Teniers (5-382, 390 illus.), who linked the Flemish with the Dutch schools.

B. Dutch School (5-382; 6-34). Scenes of the country and of home life, fine portraits, superb still life and religious subjects; the Dutch school of marine-painters is the greatest of its type there has ever been.

a. Portrait Painters : Rembrandt (6-382; 5-388 illus.), a genius who excelled in whatever he touched; Frans Hals (4-121 with illus.; 5-384, 389 illus.); Terborch (5-384).

b. Genre Painters : The Van Ostades (5-384); Gerard Dou (5-384); Metsu (5-384); Pieter de Hooch (5-383 illus.); Jan Vermeer (7-391, 392 illus.; 5-385 illus.; 6-35), greatest of "little masters"; Jan Steen (5-384), at once jovial and a moralist; Beerstraeten (5-391 illus.).

c. Landscape and Animal Painters : Van Goyen (5-384); Cuyp (5-384); Ruysdael (5-384); Hobbema (5-384, 390 illus.). Paul Potter (5-384); Wouwerman (5-384).

d. Marine Painters : The Van de Velde (5-384, 391 illus.); Van de Capelle (5-384); Backhuysen.

e. Flower and Still-life Painters : Van Huysum (5-384, 390 illus.); De Heem (5-384); Hondocoeter.

f. Modern: In the 19th century a Dutch landscape school arose which achieved enormous popularity; its exponents were Josef Israels (5-384); the brothers Maris (5-384); Anton Mauve. Jongkind (*f.i.*), an impressionist, was of the same date.

C. German School. Harsh realism, combined in early works with a certain religious mysticism, characterises this art.

a. Dürer (2-138) and Holbein (4-185). These great masters of the 16th century stand far above all others in Germany; both excelled in portraiture and religious art; both produced also fine wood engravings (8-153).

b. Other painters: The Cologne School, Lucas Cranach the Elder (*f.i.*) and his son, also Lucas; Hans Holbein the Elder (*f.i.*), father of more famous Hans Holbein the Younger (4-185).

VI. SPANISH, FRENCH, AND ENGLISH TO 1800.

A. Spanish School (7-112). The natural tendency of Spanish art has always been towards asceticism, and only by its greater artists is Spanish painting released from the grip of Spanish mysticism.

Noted Painters : José de Ribera (Lo Spagnoletto) (7-121), a follower of the Neapolitan

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Naturalist School; Zurbaran (7-112), first great Spanish master; Velazquez (7-333, 117 illus., 385 illus.; 5-115 illus.), one of world's greatest artists; Murillo (5-297; 7-112 illus.), a master of genre as of religious art; the bold and versatile Goya (4-53; 7-119 illus.); El Greco (4-70; 7-116 illus.), the Cretan-born mystic.

B. French School (3-439). For centuries painting in France was connected with the Church, then with the court. Nowhere else does the artist receive such official encouragement or find such freedom, and nowhere else does art reflect so well the country's history. The classical landscape was a French development of the reign of Louis XIV. Then the keynote changed to frivolous gaiety and elegance, though the "back-to-nature" work of Greuze and Chardin found ready appreciation.

Noted Painters: Jehan Fouquet (3-439), greatest early French artist; the brothers Le Nain (3-439, 443 illus.), portrayers of peasant life; Nicolas Poussin (3-439, 443 illus.), a very great painter; Charles Le Brun (*f.i.*), court painter to Louis XIV; Claude Lorrain (3-439, 442 illus.; 6-34), the "discoverer of sunlight," who developed the classical landscape; Antoine Watteau (3-439, 440 illus.; 6-34), one of France's greatest masters, in whose work French elegance and vivacious charm find their first expression; Nattier (*f.i.*), painter of the great ladies of Louis XV's court; Boucher (3-439, 444 illus.) and Fragonard (3-439), in whose work beauty tends toward mere prettiness; sentimental Greuze (*f.i.*) and unaffected Chardin (3-439, 445 illus.; 6-34), painters of humble people; Philip de Champaigne (3-441 illus.), typical portrait painter.

C. English School (3-258). Influenced at first by illumination, and later by Holbein and the miniature painters, later still by the Flemish portrait painters, in the 18th century English painting came into its own, chiefly as a school of portraiture, but also in landscape, especially (in early 19th century) landscape in water-colour.

a. Miniature painters: Nicholas Hilliard (3-258), influenced by illumination; the Olivers (3-258); John Hoskins (3-258); Samuel Cooper (3-258 illus.); Richard Cosway (3-258).

b. Portraiture: Lely (*f.i.*; 3-259) and Kneller (*f.i.*; 3-259; 5-132 illus.); Hogarth (4-184; 3-208 illus., 265 illus.; 6-137 illus.), also a great genre painter; Reynolds (6-339; 3-260 illus., 266 illus., 286 illus.); Gainsborough (3-46, 267 illus.; 6-208 illus.); Romney (*f.i.*; 3-260, 259 illus.); Raeburn (3-260); Hoppner (3-260); Lawrence (*f.i.*; 3-260).

c. Landscape: Richard Wilson (3-260, 261 illus.); J. M. W. Turner (7-337 with illus.; 3-269 illus.); John Constable (2-487; 3-268 illus.); "Old" Crome (3-260, 269 illus.).

d. Genre Painters. The Devis family and Zoffany (1-311 illus.), founder of the "con-

versation piece"; Morland (3-264); Wheatley (3-264); Stubbs (*f.i.*; 3-273).

e. Water-colour School. The English school is pre-eminent in this branch of painting, whose development is traced from Paul Sandby (3-261) and Girtin (3-261, 271 illus.) through the Cozens (3-261) family to J. N. Cotman (2-515; 3-261 illus.); Do Wint (3-262); and David Cox (3-262). Great oil-painters who also did fine work in this medium are Turner (7-337) and Constable (2-487). Here, too, comes William Blake (1-482).

VII. MODERN PAINTING

In the 19th century France assumed the position of teacher in the graphic fine arts that had been held earlier by Italy. Many movements in painting have radiated from Paris, though England claims a notable school of landscape painting headed by Constable (2-487) and Turner (7-337), and the Pre-Raphaelite movement (6-283) was born and died there. In France, revolutionary classicism was followed by Romanticism and that by the Barbizon School (3-440; 2-512), after which a number of movements were on foot at the same time.

A. In France.

a. Classicism, which coincided with Napoleon: David (3-439, 444 illus.) and Ingres (3-440; 5-47 illus., 505 illus.) were its great exponents.

b. Romanticism, a reaction led by Géricault (*f.i.*) and Delacroix (3-440).

c. The Barbizon School (3-440; 2-512), led by Corot (2-512) and J. F. Millet (5-208; 3-446 illus.); a minor group followed Courbet (3-440).

d. Impressionism (4-236; 3-440; 6-34). This almost world-wide movement began with the work of Claude Monet (*f.i.*; 3-440, 447 illus.; 4-237, 236 illus.); the group also included Édouard Manet (*f.i.*; 3-440; 4-237); Degas (3-449; 1-352); Renoir (4-237; 3-449, 448 illus.); Pissarro (3-449; 4-237) in France; in Germany, Liebermann (*f.i.*); Slovogt; and Corinth; in Spain, Sorolla (*f.i.*) and, to a certain extent, Zuloaga (7-121, 120 illus.).

e. The Post-Impressionists (6-270). Having comparatively little in common, these painters continued to rebel against academic art and laid the foundations for later groups. Gauguin (*f.i.*; 3-449); Van Gogh (7-381; 3-449); and Cézanne (2-298; 3-447 illus.) were leading figures.

f. Later Groups. Matisse (*f.i.*; 3-449); Braque (3-449); Rouault (*f.i.*; 3-449); and Picasso (7-121; 3-449, 124 illus.), greatest of modern masters, each had followers. The first of these was concerned with new scales of colour and pattern, and founded the "Fauvist" school (3-449); the second with a strange type of picture derived from still-life; the fourth, great above all as a draughtsman, remains a ceaseless experimenter. To Picasso, with Cézanne (2-298; 3-447 illus.),

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was due Cubism. German Expressionism (*f.i.*) was a revolt against Impressionism (4-236). Futurism (4-320), an Italian manner; and Surrealism (*f.i.*; 3-449) were short lived.

B. In England.

a. Portraiture. Fine portraiture continued, Alfred Stevens (6-524), and G. F. Watts (3-262; 6-6 illus.; 7-11 illus.) being outstanding in the mid-19th century; later came the American, Sargent (3-264); Orpen (*f.i.*; 3-262); McEvoy (*f.i.*), and others.

b. Subject Pictures. These achieved in Victorian England perhaps a greater popularity than ever before. William Frith (3-264, 263 illus.) with his enormous canvases full of life, and the Pre-Raphaelite Brotherhood (6-283), led by Rossetti (6-285; 3-264); Holman Hunt (6-285, 284 illus.; 3-264; 4-367 illus.); and Millais (5-207, 208 illus., 138 illus.; 2-243 illus.; 4-201 illus.; 3-270 illus.), represented two very different approaches to this type of picture. Burne-Jones (3-264; 5-260; 6-285); Ford Madox Brown (*f.i.*, 3-264 illus.); Watts (3-262; 6-6 illus.; 7-11); and Lord Leighton (3-273, 124 illus.) were other successful painters of subject pictures.

c. Impressionism, Surrealism. After the representational art of the 19th century came an Anglicised Impressionism, whose chief exponents were Whistler (3-262 with illus.); Sickert (4-237; 3-263); Wilson Steer (3-263, 271 illus.; 4-237); Tonks (*f.i.*); and members of the Camden Town and London Groups (*f.i.*) such as Harold Gilman and Charles Ginner, Henry Lamb and Duncan Grant (*f.i.*).

d. Other Artists. William Etty (3-264) is reckoned a fine painter of the nude; Landseer (3-264, 263 illus.; 1-93 illus.) of animals. Twentieth century artists include Augustus John (3-263, 272 illus.), excelling as portrait painter; Paul Nash (3-262); Stanley Spencer (*f.i.*; 3-273 with illus.); Graham Sutherland (3-262, 260 illus.).

VIII. ORIENTAL PAINTING.

The paintings of the East have proved even more perishable than those of the West, for they were executed in water-colours on silk or paper or parchment, sometimes, in India and Persia, embellished with a good deal of gold.

A. China (2-363, 373 illus.; 6-37). Chinese literature as far back as the Han dynasty (206 B.C.-A.D. 221) makes frequent reference to paintings, but no examples of work earlier than about A.D. 400 are known to exist. Landscape, real or imaginary, is the favourite subject, with trees and flowers coming next. Indigenous Chinese art never developed portrait painting in the Western manner, although appropriate figures often appear in landscapes, in domestic scenes, and in illustrations of moral precepts and legends.

B. Japan (4-352). Japanese painting, like the other Japanese arts, including writing, is derived from the Chinese, and developed much later—from about the eighth century A.D. Landscape, especially representations of the sacred mountain Fujiyama (4-341, 346 illus.), flowers, and birds are usual subjects, but portrait figures are also common. The Japanese excel in the colour print (8-153).

C. Persia. Persian painting, with its delicacy and brilliance, is akin to the art of the Western illuminator and miniaturist rather than that of the painter in oils. Formalised flower gardens; groups of veiled ladies; warriors in colourful turbans and gorgeous attire, wielding mighty bows and bestriding spirited horses: these are the subjects of the artists who flourished in the 15th to 17th centuries A.D.

D. India (4-249). Besides miniature-style paintings in the Persian manner of formal gardens jewelled with flowers and of ladies in flowing saris (17th and 18th centuries), India has paintings of a much earlier date in the frescoes of the caves of Ajanta (4-248 illus.).

The rise of Islam, which forbids the representation of the human likeness in any medium, and its spread throughout western Asia and into northern India, stultified the development of all painting in areas where that faith became dominant.

Interest-Questions in Painting

Which Spanish artist was appointed court painter to Philip IV at the age of 24? 7-384.

Who painted the series of pictures called *Marriage à la Mode*? 4-185 illus.

Who were the great animal painters of pre-history? 6-33.

Where were a number of the first Christian paintings made? 6-33.

Which Italian artist painted "*Mona Lisa*," and where is this picture to be seen? 4-482 illus.

Which French painter was called "the founder of modern art"? 3-439.

Who painted a celebrated series of notabilities at the court of Henry VIII? 4-180.

Which European country is said to have produced more "old masters" than any other? 4-317.

To whom can be attributed the oldest known oil paintings? 5-381.

Which painter's followers were called *Giotteschi*? 4-317.

Which artist is reputed to have painted 36 portraits of Charles I? 5-392.

Who painted a famous fresco of "*The Last Judgment*," and where is this masterpiece to be seen? 4-321.

What is a fresco? 6-36.

When did Byzantine art reach its maturity? 6-33.

Who among the Venetian colourists of the 16th century stands unrivalled? 7-283.

To what group of painters did Dante Gabriel Rossetti belong? 6-284.

Who invented oil-painting? 6-36.

Who was the first British landscape painter to achieve renown on the Continent? 3-260.

Who was the first president of the Royal Academy? 3-259.

Which French Impressionist painter is famous for his pictures of ballet dancers? 3-440.

What was El Greco's real name? 4-70.

PHYSICS

THE scope of modern physics and its relations with other branches of science are indicated in the main article on the subject (6-185). It deals with the inanimate aspects of Nature as distinct from living organisms, dealt with by biological sciences. But the distinction between physical and biological science is not sharp, and such studies as biophysics and biochemistry occupy a boundary position.

I. GENERAL PROPERTIES OF MATTER.

A. Mass. Fundamental property of all material objects, corresponding to the simple notion of the amount of matter which they contain (6-185). See also Mechanics outline, 8-176.)

B. Volume or Extension. Also a fundamental property, corresponding to the simple notion of the amount of space which objects occupy.

C. Density. The mass per unit volume, corresponding to the simple notion of how tightly matter is packed in a substance. Densities are now quoted in grains per cubic centimetre or more accurately in grams per millilitre (6-185).

Relative Density or Specific Gravity (S.G.) is the ratio between the density of a substance and that of some standard substance—usually hydrogen (at 0° C. and atmospheric pressure) for gases and vapours, and water at (4° C.) for solids and liquids. Since the density of water at 4° C. is 1 gm. per ml. the S.G. of solids and liquids is numerically the same as the density.

D. Elasticity. The extent to which a substance tends to return to its original shape after being deformed.

Stress and Strain. The measure of the deformation is called the strain. The force producing it is called the stress.

Elastic Limit. Maximum amount of stress or strain beyond which material yields and no longer returns to its original shape. (Sometimes used for the point beyond which strain is no longer proportional to stress.)

Measures of Elasticity. Young's modulus gives the relation between a squeezing or a stretching force and the change of length it produces; the bulk modulus gives the relation between a compressing or an expanding force and the change in volume it produces; the rigidity modulus gives the relation between a twisting or shearing force and the change in shape it produces.

E. Viscosity. The tendency of a fluid to resist the motion of one layer relative to the next. Viscosities of liquids can be calculated from their rate of flow through narrow tubes, or from the speed at which small spheres of known weight and size fall freely through them. The unit is the poise, equal to one dyne second per sq. cm. Viscosity in liquids decreases with increased temperature; in gases it increases.

F. Hardness, Malleability, Ductility. These properties are chiefly important in metallurgy. A rough indication of relative hardness is given by Mohs' Scale, based on a series of substances each of which will scratch the one before.

Similar scratching tests serve to place any given substance in the series. Quantitative measures depend on how deeply a small sphere (Brinell scale) or pyramid (Tukon scale) of known dimensions will dent the material under a given load.

II. STATES OF MATTER.

A. Solid. A solid has a definite mass, a definite volume, and a definite shape. All true solids are either single crystals or collections of crystals (sometimes very numerous and microscopic in size) all stuck together (3-6).

Crystal Structure. In a crystal the atoms are all arranged in a definite, regular, and more or less rigid order in space (3-5). Many of the physical properties of different materials can be explained by their crystal structure; e.g. alloys (1-114) and plastics (2-321).

B. Liquid. A liquid has a definite mass, a definite volume, but no definite shape. Liquids strongly resist any change in bulk, but offer no permanent resistance to shearing forces. Attempts to explain this behaviour on the basis of kinetic theory have not been entirely successful; but it is clear that the atoms are in some way still partially organized in space (4-520).

C. Gas. A gas has a definite mass, but no definite volume or shape.

Gas Laws. For any given mass of gas the volume, v , varies inversely with the pressure, p , if the temperature is constant (Boyle's law); and directly with the absolute (Kelvin) temperature, T , if the pressure is constant (Charles's law). These are combined in the expression $pv = RT$, where R is the gas constant, and is equal to 83,145,000 erg per degree per mole. These laws would apply exactly only to an ideal gas whose molecules had no size at all and exercised no attraction on each other however closely they approached. The behaviour of actual gases is represented more closely by van der Waals' equation: $(p + a/v^2)(v - b) = RT$, where a takes account of the mutual attraction of the molecules, and b is proportional to their volume (3-508).

D. Colloids. Systems in which one substance (called the disperse phase) is scattered in the form of very small particles (of which one dimension at least is between about 1/1,000 and 1/1,000,000 mm.) through another substance (the dispersion medium). Systems in which solid particles are dispersed in solids, however, are not usually called colloids; whereas some substances which have molecules of colloidal size exhibit colloidal properties without being dispersed through another medium (2-455).

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MECHANICS

The whole of mechanics is based on Newton's three laws of motion (5-159). From these a complete system can be built up relating the motion of bodies to their masses and the forces acting on them. In the basic theory the effects of friction (3-470) are neglected.

A. Units. These are based on three fundamental units, usually of length, mass, and time. Three common systems are: the centimetre-gram-second (C.G.S.) system used in scientific work, the metre-kilogram-second (M.K.S.) system of practical units used in technology, and the foot-pound-second (F.P.S.) system used in engineering.

a. Mass. This is measured by "weighing" in a balance against standard masses (usually called "weights") which have themselves been checked directly or indirectly with the international prototype kilogram in Paris or the imperial standard pound in London (6 185). The units are the gram, kilogram (1,000 grams), and pound.

Note In spite of the names of the units and the method of measuring, mass, representing "quantity of matter," should be clearly distinguished from weight, which is the force with which any given mass is attracted to the earth by gravity.

b. Speed, Acceleration. Uniform speed in a straight line, or instantaneous speed, is measured in centimetres, metres, or feet per second. If the speed increases or decreases, the moving object is said to undergo an acceleration (positive or negative). If in the course of one second the speed increases by one centimetre per second, then the acceleration is 1 cm. per sec. per sec. Similarly for 1 metre per sec. per sec., and 1 ft. per sec. per sec.

c. Force. Anything that imparts an acceleration to a mass is called a force. Units: the dyne, which gives a mass of 1 gm. an acceleration of 1 cm. per sec. per sec.; the newton (100,000 dyne), which gives 1 kg. an acceleration of 1 metre per sec. per sec.; the poundal, which gives 1 lb. an acceleration of 1 ft. per sec. per sec. (Note that since the acceleration due to gravity at the earth's surface is approximately 32 ft. per sec. per sec., 1 lb. wt. is equal to 32 poundals.)

d. Work, Energy. Work is the product of a force and the distance through which it acts. Units: the erg, work done by a force of 1 dyne acting through 1 cm.; the joule (10,000,000 erg), work done by 1 newton acting through 1 metre; the foot-poundal, work done by 1 poundal acting through 1 ft. (In engineering the unit is the ft. lb., equal to 32 ft. poundals.) Energy is the ability to perform work and is measured in the same units (3-245).

e. Power. Rate at which work is done. Units: the erg per second; the watt, equal to 1 joule per sec.; the horsepower, equal to

550 ft. lb. per sec. or 746 watt. (The kilowatt-hour or Kelvin, by which electricity is usually sold to the public, is a unit of energy representing the work done when a power of 1,000 watt is maintained for 1 hour. It is thus equal to 3,600,000 joule.)

B. Statics. Branch of mechanics which deals with forces in equilibrium, i.e., so balanced that they produce no motion.

a. Polygon of Forces. If two or more forces acting at a point are in equilibrium, they can be represented in magnitude and direction by successive sides of a polygon.

b. Parallelogram of Forces. If two forces acting at a point are represented in magnitude and direction by adjacent sides of a parallelogram, they will be together equivalent to a third (the resultant) represented by the diagonal of the parallelogram (5 156).

Note: Forces and velocities are called vector quantities because in order to define them completely it is necessary to specify their direction as well as their size. The parallelogram is a graphic method of compounding two forces or velocities which gives the same results as addition in vector algebra.

c. Resolution of Forces. Any single force can be considered as equivalent to two separate forces represented by two sides of a parallelogram of which it forms the diagonal. Usually a single force is resolved into two components at right angles to each other, or (in three dimensions) into three components in mutually perpendicular directions (5 156).

d. Machines. A machine is a contrivance that enables a force applied at a given point to do work conveniently. Thus a small force acting through a large distance may be made to raise a large weight through a small distance. The six simple machines are: the lever, the pulley, the inclined plane, the wedge, the screw, the wheel and axle (5-157). Similar results can be obtained by hydraulic devices (4 214).

C. Dynamics deals with moving bodies.

a. Kinematics deals with the motion only, without taking account of the forces producing it. If u is the initial speed of a body; v its speed after t seconds; a its acceleration; and s the total distance covered, then:

$$\begin{aligned} v &= u + at \\ s &= \frac{1}{2}(u + v)t \\ s &= ut + \frac{1}{2}at^2 = vt - \frac{1}{2}at^2 \\ v^2 &= u^2 + 2as \end{aligned}$$

From these formulae it can be shown that the path of any projectile thrown or shot into the air will be a parabola, while the path of a stone dropped from an aeroplane will be half a parabola (5-57), provided that in both instances air friction is neglected.

b. Kinetics deals with the relations between motion and the forces producing it. A particle is defined as a body possessing mass.

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but so small in size compared with the distances over which it moves that it can be considered as virtually a point.

1. Momentum. Product of mass and speed. $M = mv$. The principle of the conservation of momentum states that in any system of mutually attracting or impinging particles, the total linear momentum in any fixed direction remains unaltered unless there is an outside force acting in that direction.

2. Energy. The energy of a particle may be of two kinds :

Kinetic Energy, which it has by virtue of its motion. Kinetic energy $E_k = \frac{1}{2}mv^2$.

Potential Energy, which it has by virtue of its position. If it is raised to a height h then its potential energy $E_p = mgh$, where g is the acceleration due to gravity.

If a body raised to a height h then falls through that distance, its velocity at the bottom will be given by

$$v^2 = u^2 + 2as = 0^2 + 2gh = 2gh.$$

Its kinetic energy will therefore be given by

$$E_k = \frac{1}{2}mv^2 = \frac{1}{2}m(2gh) = mgh.$$

Thus potential and kinetic energy are interchangeable without loss and without gain. This is a simple example of the principle called conservation of energy.

3. Centrifugal Force. This acts outwards whenever a particle is constrained to move in a circle (2 293). If the radius of the circle is r the centrifugal force is mv^2/r .

c. Rigid Bodies. These are considered as collections of particles whose mutual positions remain invariable.

1. Centre of Gravity. In every position of a rigid body the force of gravity acting on the body appears to act in a direction passing through one particular point called the centre of gravity (5 157).

2. Stable and Unstable Equilibrium. If when the body is slightly displaced the forces acting on it tend to bring it back to its original position, the body is in stable equilibrium; if they tend to increase the displacement, it is in unstable equilibrium (5 156).

3. Rotation. This form of motion is measured in angular measure (degrees, radians, or revolutions) per second (or per minute, etc.).

4. Torque. Two equal and parallel forces acting in opposite directions so as to produce turning are called a couple. The torque or amount of the couple is the product of one of the forces and the perpendicular distance between them.

5. Moment of Inertia. For a single particle, this is a product of its mass and its distance from the axis of rotation. For a whole body it is the sum of these products for all the separate particles. Finding such a sum is a problem in the integral calculus.

Results for simple geometrical forms are :
Solid sphere rotating about a diameter, $\frac{2}{5}mr^2$.

Flat disc rotating about one diameter, $\frac{1}{2}mr^2$.

Cylinder rotating about its axis, $\frac{1}{2}mr^2$.

Thin rod rotating about a line perpendicular to its length passing through centre $\frac{1}{12}ml^2$; through one end, $\frac{1}{3}ml^2$.

The kinetic energy of a rotating body is given by $E_k = \frac{1}{2}\omega^2 I$, where ω is its angular velocity (in radians per second) and I its moment of inertia.

D. Field Theories.

a. Newtonian Theory of Gravitation. Any two particles of matter will attract each other with a force proportional to the product of their masses and inversely proportional to the square of their distance apart (4 66). On the basis of this one law it can be shown (among other things) that the path of a planet round its sun will be an ellipse with the sun at one focus (7 188); that any two bodies falling from the same height in a vacuum will fall at the same (increasing) speed whatever their weight or shape (4 66); that the path of a projectile fired at any angle above the horizon would (but for friction and the curvature of the earth) be a parabola.

The effects of gravity are indistinguishable from the effects of any other form of continuous acceleration, e.g. centrifugal force (2 203).

b. Relativity. The Newtonian system is based on the assumption that some one frame of reference in the universe can be taken as being at rest, e.g. the ether (3 302). Einstein denied this assumption, and modified Newton's equations slightly, first so that they would remain the same for all observers who were moving uniformly relative to each other (Special Theory of Relativity); then for all observers even though their relative motion was accelerated (General Theory of Relativity). The difference is observable only when dealing with very great distances or very high speeds (6 380).

c. Unified Field Theory. Einstein's later attempt to include electric and magnetic forces with gravitation under one set of equations is apparently not susceptible of experimental proof.

d. Hydrostatics deals with conditions of equilibrium in fluids.

1. Pressure. At any point in a fluid the pressure is the same in all directions. It is measured as the force pressing on unit area, in dynes per sq. cm., or lb. per sq. in. (Here lb. is the pound-weight, and hence a unit of force.) Pressure in gases is often measured in terms of the number of inches or millimetres of mercury (ins. or mm. Hg) which it will support.

Average atmospheric pressure at sea level, measured by a barometer, is equal to about 29.9 ins. Hg, 760 mm. Hg, 14.7 lb. per sq. in., or just over 1 million dynes per sq. cm. For this reason an international unit of pressure,

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the bar, equal to 1,000,000 dynes per sq. cm., has been agreed.

1 bar = 1,000 'millibars' = 750.07 mm. Hg; 1,016 mb. = 30 ins. Hg. (1-370).

If a liquid has a free surface, the pressure at any point P below it is equal to the pressure on the surface (usually the atmospheric pressure) plus the weight of a column of the liquid of unit cross section extending vertically from the surface to the level of P. Hence the rapid increase of pressure with depth at sea (8-95).

Pressure applied at any one point is transmitted uniformly throughout the liquid. This is the principle of the hydraulic press and the hydraulic jack. It also accounts for the tendency of all liquids to "find their own level," and for the working of the siphon.

b. Principle of Archimedes. If a body is immersed in a liquid, its apparent loss in weight is equal to the weight of the liquid displaced. This is the principle of the hydrometer and can be used for finding the density either of a solid or of a liquid (4-222).

The total weight of a floating body is equal to the weight of the liquid displaced.

F. Hydrodynamics deals with fluids in motion. As a first approximation the theory is worked out for a "perfect fluid," i.e., a fluid which is completely incompressible and offers no resistance at all to distorting forces.

a. Types of Fluid Motion. Steady motion is such that at any given point the direction and speed of movement remain constant. Turbulent motion has a certain amount of irregular

movement (usually in the form of eddies) superimposed on the general motion. Cavitation occurs when the continuity of the liquid is broken and gaps (which may be extremely small) are formed in the body of the liquid. This happens only with very violent motion (e.g. round ships' propellers when they are run too fast). In the absence of cavitation, the motion is said to be continuous.

b. Streamline. Any imaginary line in a steadily moving fluid such that at any point on it the particles of the fluid are moving along that line.

c. Equation of Continuity. In a fluid flowing steadily in a tube, or through any system where no particles of the fluid cross the boundaries in either direction, the average speed in any part is inversely proportional to the area of the cross section.

d. Bernoulli's Theorem. In a stream flowing horizontally through any such system the pressure will be least where the speed of flow is greatest.

Note. The whole of mechanics is sometimes classified as a branch of applied mathematics rather than of physics.

G. Hydraulics is the branch of engineering that deals with the application of hydrostatics and hydrodynamics to practical purposes. It is chiefly concerned with the behaviour of water and oil when confined to pipes and channels (4-214.)

Aerodynamics is similarly concerned with the application of hydrodynamics to the practical problems of flight (1-31).

HEAT

Kinetic Theory. The sensation of heat results from movements of the molecules of which a substance is composed (4-145). Gas molecules move in straight lines until they collide either with each other or with other substances, e.g. the walls of their container. Molecules in a solid vibrate around a fixed position. Liquid molecules also vibrate about a mean position, but that is not necessarily fixed and may move relatively to the rest of the liquid and to neighbouring solids, e.g. when the liquid flows (4-520). The explanation of thermal phenomena on the basis of molecular motion is called the kinetic theory (3-508), and the branch of mathematics used to find out the combined effect of very large numbers of individual movements is statistics (5-148).

Temperature. The physical property corresponding to our sensation of how hot or how cold a body may be. It is found to correspond also to the average speed with which the molecules of a substance are moving (4-146).

Expansion. Most solids and liquids expand slightly with increased temperature, the faster vibrations of the molecules requiring (so to speak) more elbow-room. The coefficient of linear (bulk) expansion is the ratio of the extra length (volume) produced by a rise of one degree

in temperature to the original length (volume). Exceptions to the rule of expansion are: water between 0° C. and 3.8° C., which contracts slightly, and a special alloy invar (64% iron, 76% nickel with traces of other metals) which hardly changes in size at all (5-432).

The rule for the expansion of gases was first stated in the form of Charles's law (called Mariotte's law in France): the volume of a given mass of any gas at constant pressure increases by 1/273 of its volume at 0° C. for every degree by which its temperature is raised. This is now combined with Boyle's law in the more general gas laws represented by the formula $pv = RT$.

Measurement of Temperature. Ordinary thermometers measure temperature by the expansion of mercury in glass or of alcohol in glass (7-267). The gas thermometer measures the expansion of a gas (usually hydrogen) under constant pressure; this is more uniform than the expansion of liquids. Temperature can also be measured by electrical effects, such as the change in resistance of certain substances at different temperatures (platinum resistance thermometers), or the thermo-electric current produced (thermo-couples). Very high temperatures are measured by the strength or colour of the light emitted (optical pyrometers).

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Temperature Scales. Common practical scales are Centigrade, Fahrenheit, and Reaumur (7-267). The absolute, thermodynamic, or Kelvin scale is theoretically independent of any particular substance used in a thermometer. The degrees are approximately equal to those in the centigrade scale, and correspond closely to those registered by a gas thermometer.

Zero on the Kelvin scale is that temperature (-273.16°C.) at which, theoretically, the molecules of a substance would have no movement at all. It can never be attained in practice, though temperatures down to 0.01°K. have been attained in special apparatus.

Other points on the Kelvin scale were agreed internationally in 1948 as follows:

Boiling point of liquid oxygen	90.19°K.	-182.97°C.
Melting point of ice	273.16°K.	0°C.
Boiling point of water	373.16°K.	100°C.
Boiling point of sulphur	717.76°K.	444.6°C.
Melting point of silver	1233.96°K.	960.8°C.
Melting point of gold	1336.16°K.	1063.0°C.

Quantity of Heat. This corresponds to the kinetic energy of the moving molecules (4-148). Units: the calorie or gram-calorie, being the amount of heat required to raise the temperature of one gram of water by one degree centigrade (since this varies slightly with temperature, it may be necessary to specify the 15° calorie which will raise the temperature of one gram of water from $14\frac{1}{2}^{\circ}$ to $15\frac{1}{2}^{\circ}\text{C.}$, or the mean calorie, 100 of which will raise the temperature of 1 gram of water from 0° to 100°C.); the Calorie or kilocalorie (used in physiology), equal to 1,000 gram-calories; the British thermal unit (B.Th.U.), defined as $1/180$ of the amount of heat required to raise the temperature of 1 lb. water from 32° (melting-point) to 212°F. (boiling-point).

The measurement of quantities of heat is called calorimetry, and the instruments used for the purpose are called calorimeters.

Production of Heat. Heat is produced in various ways: e.g. by chemical reactions, notably burning (2-323); by friction (3-470); by electric currents (4-147); by radio-activity and other atomic processes (1-290).

Transfer of Heat. This can be by three methods: conduction, convection, and radiation (4-147).

Mechanical Equivalent of Heat. This was first measured by Joule, using apparatus in which water was heated by the rotation of paddles (2-325). Modern methods, using electrical currents, make the 15° gram-calorie equivalent to 41.852 million ergs of energy.

Specific Heat. Amount of heat required to raise 1 gm. of a substance through 1°C. Specific heat varies to some extent with temperature.

Dulong & Petit's Law. The product of the specific heat and the atomic weight (called the atomic heat) of any solid element will be approximately 6.4 (in practice there are many exceptions to this rule, some of which are explained by quantum theory).

Latent Heat. Heat absorbed without change of temperature when a solid changes to liquid (latent heat of fusion), or when a liquid changes to a vapour (latent heat of evaporation). When the vapour condenses or the liquid freezes an equivalent quantity of heat is given out. The latent heat of steam at 100°C. is about $54^{\circ}\text{cal. per gm.}$ ($970\text{ B.Th.U. per lb.}$); of ice at 0°C. , about 80 cal. per gm.

Thermodynamics. Science dealing with the mathematical relations between heat and work (4-148). Developed first in the 19th century in order to calculate the efficiency of steam engines. Later applied to other heat engines (e.g. internal combustion engines, gas turbines) and other forms of energy conversion (e.g. chemical reactions, thermo-electricity, atomic disintegration).

SOUND

Sound is a form of wave motion, consisting of longitudinal or compression waves which can travel not only in air but in any elastic medium.

A. CHARACTERISTICS OF SOUNDS.

a. **Notes and Noises.** In musical notes the wave motion is comparatively regular and the wave forms repeat themselves fairly accurately a certain number of times a second. That number is called the frequency. The length of the repeated wave form is called the wavelength. The wavelength multiplied by the frequency gives the distance which the wave travels in a second, i.e. the velocity (7-86).

Noises are produced when the wave forms show no such regularity.

b. **Pitch.** Whether a note sounds high or low depends on the frequency. The human ear when young can hear from about 20 c/s to 20,000 c/s. Vibrations above this frequency are called ultrasonic (7-843).

c. **Loudness; Intensity.** This depends on the energy carried by the wave, the speed with which the air particles move, or the amplitude of the displacement (7-86). The ear, however, judges loudness to increase in successive steps as the energy per sq. cm. is repeatedly doubled, so that scales for the measurement of loudness and sound intensity are usually logarithmic.

1. **Bel, Decibel.** Units of difference in sound intensity. A decibel represents the smallest difference in intensity that a normal ear can detect at about 1,000 c/s.

2. **Phon.** Unit of loudness. Since apparent loudness varies considerably with pitch, the sound to be measured is matched with a pure tone at 1,000 c/s. The loudness in phons is then equal to the number of decibels in this reference tone above an arbitrary zero of $10^{-16}\text{ watt per sq. cm.}$

d. **Timbre.** This is the quality of the sound, by which a violin can be distinguished from a tin

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whistle or the voice of one person from another. It depends on the number of upper partials present as well as the fundamental note sounded (7-86).

B. SOURCES OF SOUND.

a. **Strings.** These can be plucked, struck with a hammer, or bowed. The frequency of the note varies inversely with the length of the string, directly with the square root of the tension.

b. **Air Columns.** These are set vibrating by reeds, lips, or edge tones. The frequency varies inversely with the length of the tube or pipe. Stopped tubes (*i.e.* tubes closed at one end) sound an octave below open tubes.

c. **Tongues and Reeds.** The note depends on the elasticity of the material, its length, and its weight. If the elasticity is very weak the vibration may accommodate itself to the frequency of an attached column of air (*e.g.* clarinet). In tuning-forks, however, where the elasticity is high, the tone is very pure, and the instrument forms the most convenient standard of pitch (7-87).

d. **Plates.** The vibration of these may be complicated, as shown by Chladni figures (7-86).

e. **Bells.** Even more complicated than plates. Partially are often louder than fundamentals and include sharp discords (1 424).

f. **Sirens.** Here the sound is produced by puffs of air or steam which pass through a revolving wheel (7 87).

C. BEHAVIOUR OF SOUND WAVES.

a. **Reflection.** Sound is reflected from smooth surfaces. Echoes are sounds reflected back from walls, cliffs, etc. (3 156). Walls of concert halls, broadcasting studios, etc., often have to have their surfaces broken up to reduce echo. The time taken for echoes to return under water forms the basis of echo sounding (6 337).

b. **Refraction.** Sound is refracted like light (4-498) when it passes from one medium to another, *e.g.* from warm air to cold, or in and out of fog.

c. **Forced Vibrations.** One vibrating body will often set another in vibration: *e.g.* a tuning fork pressed on the surface of a table. This

phenomenon is used to increase the sounds given off by strings in many musical instruments.

d. **Resonance.** If the natural frequency of vibration in the second body is the same as the frequency imposed (or a simple multiple of it), the two will reinforce each other. In the same way a sound can set a body vibrating in sympathy. Both effects are called resonance (7-87).

e. **Interference.** Where the troughs of one train of sound waves arrive at the same time as the crests of another train at the same frequency, interference occurs and the sound fades. The principle is the same as for interference in light (4-500).

f. **Beats.** When two notes of nearly equal frequency are superimposed, periods of interference alternate with periods of reinforcement, producing the beats characteristic of discords and notes out of tune in music.

g. **Velocity of Sound.** In any fluid the velocity of sound, v , is given by $v = \sqrt{E/\rho}$ where E is the elasticity of the medium and ρ the density.

Since the elasticity of a gas varies directly with its density, and the density with the pressure, the velocity of sound in any gas is not affected by the pressure. On the other hand, it is affected by temperature, and because the temperature of the atmosphere decreases with height above sea level, the velocity of sound decreases (7-87).

D. RECORDING AND REPRODUCTION.

a. **Gramophone Records.** In Edison's original system, the sound waves were represented by hills and valleys at the bottom of a groove running spirally round a wax cylinder. In later gramophone records they are represented by side-to-side displacements in a groove cut spirally on a disc.

b. **Film.** The waves are represented by variations in the extent to which the soundtrack obscures the transparency of the film. There are two kinds, variable width and variable density.

c. **Tape.** The waves are represented by variations in the magnetisation of a special magnetic tape or wire (7-87).

LIGHT

Light is made up of electromagnetic waves, with wavelengths from about 3,800 angstroms to about 7,600 angstroms (3-221).

I. HISTORICAL.

Newton held that light consisted of innumerable small flying particles or corpuscles; Huygens, that it was a form of wave-motion (4-500). In the nineteenth century the theory of a luminiferous ether was developed (3-302). Clerk Maxwell (5-149) showed mathematically that electromagnetic waves should occur in certain circumstances, and if produced that they would have the same speed as light.

II. GEOMETRICAL OPTICS.

This branch of the subject is concerned with tracking the paths of light rays through various arrangements of mirrors, prisms, lenses, etc. For this purpose the wave nature of light is virtually disregarded, and it is considered simply as a series of rays travelling in straight lines.

A. **Reflection.** When a ray is reflected, the angle of reflection is equal to the angle of incidence and both lie in the same plane (4-498).

Images formed by reflection in convex, concave, and plane mirrors (5-523).

Internal reflection and the use of prisms instead of plane mirrors (4-500).

B. Refraction. When a ray passes from one medium to another, it is bent so that its path lies closer to the normal in the denser medium (4-498).

Snell's Law : For any two given media, the ratio of the sine of the angle of incidence to the sine of the angle of refraction is constant. If the first medium is a vacuum (or in practice air), this ratio is the refractive index of the second medium. It is equal to the ratio of the speeds of light in the two media.

C. Lenses. There are various kinds of spherical lenses: double-convex, double-concave, plano-convex, plano-concave (4-481); also meniscus lenses with one face concave and the other convex, and astigmatic lenses with at least one surface cylindrical.

a. Converging and Diverging Lenses. A converging lens (*e.g.* a double-convex lens) makes parallel rays converge so that they all pass through a single point called the focus. A diverging lens (*e.g.* a double-concave lens) makes parallel rays diverge so that they all appear to have come from a single point, also called the focus (5-522).

b. Focal Length; Power. The distance from lens to focus is called the focal length or focal distance (4-481). The reciprocal of the focal length in metres gives the power of the lens in diopters.

c. Real and Virtual Images. The image formed by a lens is called real if the light rays actually pass through it; virtual if they appear to come from it without having in fact passed through it. There are two methods of working out the size, position, and nature of images: by plotting the tracks of key rays geometrically, or by applying algebraic formulae (5-522).

d. Defects of the Image. For various reasons, the images formed by ordinary spherical lenses are not perfect. The chief defects are: spherical aberration, astigmatism, coma, field curvature, barrel and pincushion distortion, and chromatic aberration. Most of these can be corrected to a considerable extent by fitting together anything up to seven separate lenses made of different kinds of glass (4-482).

D: Optical Instruments. Those based chiefly on the principles of geometrical optics include: microscopes (6-194); telescopes (7-248); cameras (6-171); projectors (2-392); light-houses (4-502); kaleidoscopes (4-391); stereoscopes (7-155).

III. PHYSICAL OPTICS.

This branch of the subject is concerned with the velocity of light, its energy relations, and the effects of its wave structure.

A. Velocity of Light. This was first estimated by Roemer from the time taken by light from Saturn's moons to cross the Earth's orbit. It was measured with a rotating wheel by Fizeau in France in the mid-19th century (4-498);

later and more accurately by Michelson in America using rotating mirrors.

A later determination, made by Dr. L. Essen at the National Physical Laboratory, England, in 1947 and 1950, using a radar resonance tube, gives the value as 299,784 Km. (186,282 miles) per sec. For many practical purposes (*e.g.* translating radio wavelengths into frequencies) the approximation 3×10^{10} cm. per sec. is sufficiently exact.

B. Diffraction and Interference. Light, like other forms of wave motion, spills round the edge of intervening obstacles; but because light waves are very short the effects of diffraction are visible on only a small scale.

If, with two trains of light waves of approximately the same wavelength, the crests of one train coincide with the troughs of another, the two cancel each other out, leaving darkness. This is called interference. If crests coincide with crests and troughs with troughs, the two trains reinforce one another.

A combination of diffraction and interference leads to such phenomena as interference fringes, Newton's rings, iridescence (*i.e.* colours of thin films). It is utilized in the instrument called the interferometer (4-500).

Interference also sets the limit to the smallness of the objects which a microscope will reveal clearly, or the closeness of celestial objects which a telescope can show as separate stars.

C. Production of Light.

a. Incandescence. All substances above a certain temperature begin to glow first red hot, eventually white hot. At the immense temperatures found in the sun and other stars not only ultra-violet but even X-rays are given off (6-330).

b. Black Body Radiation. Bodies which are black absorb most light at low temperatures and are the most efficient radiators at high temperatures. The closest approximation to perfect "black body" radiation is found in the radiation from a small hole bored into an otherwise completely enclosed cavity (6-317).

c. Photons. It was because the wavelengths in such cavity radiation did not correspond with classical theory that Max Planck suggested that the light might be made up in bundles or pellets, now called photons. The size of these is given by the formula $e = h\nu$, where e is the energy in the photon, ν is the wavelength, and h is a constant (Planck's constant) equal to 6.622×10^{-27} erg sec. (6-318).

d. Electrical Discharges. Gases and vapours give off light at ordinary temperatures when they are ionised (4-276) and carrying an electrical current or discharge (3-220).

e. Luminescence. This includes the other ways in which light is produced at room temperatures.

Fluorescence occurs with certain substances that absorb radiation at short wavelengths (*e.g.* electrons, X-rays, ultra-violet rays)

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and emit all or part of the same energy in light rays (6-161). Fluorescent substances (called phosphors) are used in television and oscilloscope tubes, luminous watch dials, fluorescent inks, etc. Where there is delay between absorption and emission so that the substance goes on glowing for a long time in the dark, the phenomenon is called phosphorescence (6-162).

Chemiluminescence occurs when light at room temperatures is produced directly by some chemical reaction, which is almost always an oxidation. Thus, phosphorus glows when the vapour round it unites with oxygen. All biological "phosphorescence" (bio-luminescence) is believed to be of this type (6-162).

C. Colour. The sensation of colour is produced by different wavelengths of light; but owing to the complicated mechanism of colour vision, different combinations of wavelengths may produce the same colour sensation. White light results from a mixture of light of all wavelengths (2-462).

a. Dispersion and Spectra. Different wavelengths of light travel at the same speed in a vacuum, but the longer wavelengths travel more slowly than the shorter wavelengths through denser media. For this reason the refractive index of glass is higher for light of shorter wavelengths; and if white light is passed through a glass wedge or prism in such a way that refraction occurs twice in the same direction, the colours will be spread out or dispersed into a spectrum. The same result can be obtained by means of diffraction and interference when the light passes through a finely ruled grating. Instruments for producing and measuring spectra are called spectrometers (7-127).

b. Line and Band Spectra. Incandescent substances give out light of certain wavelengths only, so that the spectra produced consist of narrow lines and bands. The lines are produced when electrons jump from higher to lower energy levels, the bands by various forms of vibration in the molecules. In either process energy can be exchanged only in complete bundles or quanta.

Similarly, when white light passes through substances (usually in the form of gases), precisely those wavelengths are absorbed that would be given out if the substances were energetic. Again the energy-exchange can take place only in complete quanta (1-299).

D. Photo-electricity. There are three ways in which light can affect electric circuits:

a. Photo-emission. Light falling on certain substances (e.g. sodium, potassium, caesium, strontium) leads to the ejection of electrons. This effect is made use of in the photo-electric cells used in the reproduction of film sound-tracks, and in television cameras (6-163).

b. Photo-Conductivity. Some substances (e.g. selenium, lead sulphide) have their electrical conductivity greatly increased when light falls on them (6-163). Photo-conductive

cells are used to turn light on at dark and off at dawn (e.g. on light buoys); and for detecting infra-red rays in spectrometry, and in burglar alarms, etc. (6-164).

c. Photo-Voltaic Effect. A small e.m.f. is produced when light falls on the interface between certain substances (e.g. copper and cuprous oxide). This effect is used chiefly in photographic exposure meters (6-164).

E. Polarisation. In polarised light, the magnetic displacements take place in all directions at right angles to the path of the ray. In plane-polarised light they take place in one direction (i.e. one plane) only; the electric displacements, being always at right angles to the magnetic, are similarly confined to one plane (4-501).

Plane-polarisation can be produced by reflection at certain angles; by certain crystals which have the property of birefringence; and by artificial arrangements of crystals bedded in plastic called polaroid sheets or screens.

a. Polarimetry; Saccharimetry. Many substances in solution make the plane of polarised light rotate. The extent and direction of this rotation can be used to determine the nature of a substance or the strength of a solution (4-501; 7-186).

b. Other Uses of Polarised Light. Polaroid spectacles are used to reduce the glare of sunlight reflected from snow or sea. Also in some systems of three-dimensional cinema (7-156). Polaroid windscreens, combined with polarised headlamps, have been suggested as a means of reducing dazzle in night driving.

F. Photo-Chemistry. The incidence of light promotes a number of chemical reactions that do not take place at all, or only very slowly, in the dark. One example of this is the blackening of silver salts (e.g. silver bromide) used in photography (6-181). Another is the use of light energy by green plants to build up sugars and other carbohydrates out of water, oxygen, and carbon dioxide (6-182).

G. Photometry. All methods of measuring "amounts of light" depend in the last instance on judgments by the eye that two areas are equally illuminated.

a. Units. These are based on an arbitrary standard (the candle), since the sensation of brightness does not correspond exactly with physical measurements of energy.

b. Luminous Intensity. Unit, the candle originally defined as the intensity of a spermaceti candle of fixed dimensions; now defined as one-sixtieth of the intensity per sq. cm. of a black body (or cavity) at the temperature of melting platinum. Also called candle-power and candela.

c. Luminous Flux. Unit, the lumen; amount of light flowing in one second through 1 sq. cm. of the surface of a sphere 1 cm. in radius with a source of 1 candle at the centre.

d. Illumination. Units, the lux or phot: illumination of a surface which receives 1 lumen per sq. cm.; the foot-candle: illumination of a surface which receives 1 lumen per sq. foot.

ATOMIC AND NUCLEAR PHYSICS

This branch of physics is concerned with the structure of the atom, with changes in its nucleus, and with the behaviour of sub-atomic particles both inside it and outside it.

A. Structure of the Atom. The first suggestion that the atom had a sun-and-planet structure came from Rutherford in 1911. Since then all models of the atom have pictured a minute central nucleus carrying almost all the mass, surrounded at relatively large distances by electrons in orbits, shells, orbitals or energy levels (1-297).

a. Fundamental Particles.

Electrons have a negative electrical charge e equal to 1.6020×10^{19} coulomb, and a mass m equal to 9.1078×10^{-28} gm.

Protons have a positive electrical charge of the same size as that on an electron and a mass of 1.6725×10^{-24} gm., i.e. equal to about 1,837 electrons.

Neutrons have no electrical charge and a mass of 1.67469×10^{-24} gm., i.e. slightly larger than a proton.

b. Nucleus. This is made up of a number of protons, Z , plus a number of neutrons, which is usually rather more than $2Z$; making a total number of nucleons, A . Z is called the atomic number, A the mass number (1-298).

The nucleons are held together by forces which are very great at very short distances, but rapidly decrease with separation. The nature of these forces is not known, though several theories have been put forward to describe them (1-300).

c. Electrons. The number of electrons surrounding the complete atom is equal to the number of protons in the nucleus, so that the complete atom is electrically neutral (1-298). If electrons are either lost or added, the atom becomes charged and is called an ion (4-276).

d. Elements. The atomic number, Z , determines what element an atom belongs to, and its place in the periodic table (3-224). Chemical properties depend on the surrounding electrons, particularly those in the outer shell (2-318).

B. Radio-activity. First discovered by Becquerel in 1896 in uranium. Radium was investigated by the Curies. Rutherford initiated the present-day theory.

a. Rays. Radio-active substances give off one or more of the following rays:

Alpha-Rays: streams of helium nuclei (two protons plus two neutrons).

Beta-Rays: streams of electrons.

Gamma-Rays: electromagnetic waves with wavelengths below about 10^{-10} cm. (6-351).

b. Physiological Effects. Radio-active rays, particularly γ -rays, are in general injurious to living tissues. Their destructive effect is greater, however, on rapidly multiplying cells; hence their use against cancer (6-352).

c. Methods of Detection. All three rays in varying degrees ionise gases through which

they pass, and so make them conducting (4-276). This makes it possible to detect the rays by the leakage of a charged gold-leaf electroscope; by particles counted by a Geiger counter; and by the paths of rays made visible in a Wilson cloud chamber. Paths of rays can also be traced in photographic emulsion which is affected by the rays in the same way as by light.

d. Disintegration. In giving out α - and β -rays, the atom concerned is changed into an atom of a different element. In this way three natural radio-active series are formed, the end product in each being an isotope of lead (6-351).

e. Half-Life. There is no means of telling when any particular radio-active atom will disintegrate, but of a large number of atoms of any given substance half will always have disintegrated within a characteristic period called the half-life of that substance (6-352).

C. Artificial Disintegration. This can be brought about by bombarding target atoms with streams of suitable particles at high energy. The particle streams can be derived from radio-active substances, from accelerators, or from nuclear reactors (1-299).

Accelerators. Linear accelerators, cyclotrons, synchrotrons, etc., are machines for producing such particle streams and accelerating them to high speeds in electric fields (3-17).

D. Cosmic Rays. Many particles also occur naturally in, or as a result of, cosmic rays which arrive at the earth from outer space. Cosmic rays include mesons of various masses intermediate between electrons and protons; positrons, with the same mass as electrons but a positive electric charge; deuterons, made up of one proton plus one neutron; and occasionally larger particles (6-339). All can be detected by Geiger counters and their paths traced in photographic emulsion.

Nuclear Fission. In this process a large nucleus splits into two medium-sized pieces. A slight loss of mass is accompanied by a relatively large release of energy, the relation conforming the Einstein's equation $E = mc^2$ (6-381).

a. Fission Bomb. In uranium-235 and plutonium the process occurs when the nucleus is hit by a neutron; and involves the ejection of an average of $2\frac{1}{2}$ or 3 neutrons. Hence in a mass of metal of sufficient size, fission builds up as a chain reaction. This is the basis of the original atomic or fission bomb, which explodes when a critical mass of uranium-235 or plutonium is suddenly brought together (1-300).

b. Hydrogen Bomb. This works on the opposite principle of uniting hydrogen nuclei to form nuclei of helium. To do this, however, requires such high temperatures that the process must be started off by a fission bomb (1-301).

c. Nuclear Reactors. In these the fuel is natural uranium, the chief isotope of which, uranium-238, undergoes fission only when

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hit by a comparatively slow-moving neutron. They contain, therefore, considerable quantities of graphite or heavy water to slow down the fast neutrons resulting from fission. By means of cadmium rods which absorb neutrons the chain reaction is controlled and not allowed to build up into an explosion (1-301). The heat from nuclear reactors can be used

to produce electricity. The enormous flux of neutrons which can be obtained from them is used to make radio-isotopes of many elements for use in research and medicine.

Elaborate precautions have to be taken to protect workers from exposure to the highly dangerous radiation from nuclear reactors and their products (1-302).

PHYSIOLOGY, HYGIENE, & MEDICINE

A SOUND knowledge of the structure of the human body and the normal function of its various parts is essential to healthy living. This Outline is intended merely as a brief survey of the chief parts of the body and their work, the simple laws of hygiene, and a few of the outstanding features of medical history and practice.

I. THE HUMAN BODY.

Anatomy (1-143) ; Physiology (6-189).

A. Framework of the Body.

- a. Skeleton (7-60 ; 1-144 diag.).
- b. Composition of bone (1-518).
- c. Hands (4-125).
- d. Feet (3-412).

B. Muscles (5-298) : how the body is moved.

C. Digestion (3-89) : process by which food is changed so that it can be absorbed by the body.

- a. The teeth (7-236) prepare food for digestion.
- b. The tongue (7-290).
- c. The stomach and how it works (1-144, 3-89, 90 ; 6-191 illus.).
- d. The liver (4-624), largest gland organ in the body.
- e. Other glands that aid digestion (4-27).
- f. Enzymes (*f.i.*) : chemical substances that aid digestion.

D. Circulation (4-143, 144 diag.).

- a. The blood (1-489) and its journey through the body.
- b. The heart (4-143) : hub of the circulatory system.
- c. Function of the lungs in circulation (5-52).
- d. The pulse (6-304).

E. Respiration (6-389).

- a. The lungs (5-51).
- b. The diaphragm (*f.i.*) : principal muscle of respiration.
- c. The voice (7-404) and its organs.

F. Removal of Body Wastes.

- a. Function of the intestines (3-90, 89 diag. ; 1-144).
- b. The kidneys (4-403) : the filtering plant for the blood.
- c. The sweat glands (7-63).

G. Glands (4-27) and their functions.

H. How the Body is Governed.

- a. The brain (2-40) : the executive offices of the body.
- b. The nerves (5-368) : the body's telephone system.
- c. The senses and their organs : eye (3-331) ; ear (3-147) ; tongue (7-290) and other organs of taste (7-229) ; sense of smell (7-71) ; touch (7-301).

I. The Skin (7-63) : covering of the body.

- a. Hair (4-117).
- b. Nails.

Note : Students should also read the main article on Biochemistry (1-446).

II. THE CARE OF THE BODY.

Hygiene (4-223).

A. Exercise (4-223).

- a. Physical education (6-183).
- b. Athletics (1-290).
- c. Sports, Games, and Pastimes : see under this heading in the Fact-Index.
- d. Eurhythmics (3-307).

B. Food (3-408) : what to eat for health.

- a. Proteins (6-297) and the foods that contain them.
- b. Vitamins (7-403) : substances essential to proper growth and health of the body.

C. Sleep (7-67) and its value.

D. Sanitation and Ventilation.

- a. Personal cleanliness (4-223).
- b. Heating (4-149) and Ventilation.
- c. Uses of Antiseptics (1-176).

E. Public Health.

- a. Plumbing (*f.i.*) and Sewerage.
- b. Water supply (7-425).

Note : Additional information on Hygiene is contained in many of the articles referred to in Sections I and III of this Outline.

III. HUMAN ILLNESS.

Medicine (5-161) and Surgery (7-194).

A. Germs in disease (4-14).

- a. Bacteria (1-343).
- b. Protozoa (6-293 ; 4-14).

B. Disease Carriers.

- a. Mosquito (5-271) : carrier of malaria (5-93) and yellow fever (5-271 ; 6-53).
- b. Flea (3-388) : carrier of bubonic plague (1-478).
- c. Tsetse fly (7-323) : carrier of the dreaded sleeping sickness (7-323 ; 4-15).
- d. House fly (4-264) : carrier of typhoid, etc.

C. Prevention and Treatment of Disease.

- a. Antitoxins (*f.i.*) and Serums (1-490).
1. Vaccination (7-373).

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2. The work of Pasteur (6 94).

b. Surgery.

1. Anaesthetics (1-142).

2. Use of Antiseptics (1-176).

3. Use of the X-rays (7 507) and radium (f.-i.).

c. Drugs (3-127); antibiotics (1-174); sulphadiazine (7-186); streptomycin (1-175).

Note: Many of the common drugs improperly

used are poisons. For some of the principal poisons and their antidotes, read the articles on Poisons (6 235) and First Aid (3 365).

d. Dentistry (2 236).

D. Auxiliary Medical Agencies.

a. Hospitals (4 199); nursing homes; health centres; convalescent homes.

b. Nursing (5 485) and First Aid (3 365); Red Cross Societies (6 370).

SCULPTURE

SCULPTURE (6-519), the art of carved and moulded form, is the most durable of the arts. Works of great beauty in this medium have lasted to this day from ages whose painting has disappeared or left but faint traces of what it may once have been. Most sculpture, moreover, presents its subject in the round and so, being easier of apprehension than painting, is usually the first art to attract the interest and appreciation of young people not specially gifted as draughtsmen.

I. SCULPTURAL PRACTICE.

A. Relief (6-519).

a. Bas-Relief or Low Relief (1-338 illus.; 6 522 illus.). In these sculptures the figures project only a little from the background.

b. High Relief (4-90 illus.; 6-445 illus.). Here the composition as a whole is part of the slab, but limbs and heads of individual figures here and there are almost free.

c. Sunk Relief. In this method the artist cuts into a flat surface so as to leave the figures standing in relief on a sunken ground.

B. Intaglio (6-519). In this method—the opposite of relief—the design is hollowed out below the surface. It is used mainly in the carving of precious stones and in making seals (3 292; 2 189).

C. Sculpture “in the round.” This is the most “complete” form of sculpture, the figures being, in part at least, completely “free,” so that they may be viewed from all sides.

II. PRIMITIVE WORKS

The beginnings of sculpture arise wherever men have the impulse to adorn articles of use with decorative shapes, or to give outward form to their imaginings concerning the gods or spirits they worship, as did some of the Stone Age peoples (5 107 illus., 108 illus.), and the Alaskan tribesmen who carved totem-poles (1-88 illus.); or to erect memorials bearing the features of the dead, as possibly did the unknown people that carved the stone figures of Easter Island (2-350).

III. EARLY DEVELOPMENT

A. Egyptian Sculpture.

a. Characteristics and Materials (6-520).

b. Typical Examples: The Sphinx (7-130 illus.); statues, etc. (3 187 illus., 201 illus. etc.); reliefs (3-186 illus., 188 illus., 194 illus., 199 illus.).

B. Babylonian and Assyrian Sculpture.

a. Characteristics (6-520).

b. Typical Examples: Assyrian animal sculpture (1-338 illus.); warriors (1-339 illus.); winged bulls (2-89 illus., subject 12), which

are as typical of Assyrian sculpture as the Sphinx is of Egyptian.

Aegean Sculpture (1 23 illus.).

IV. GREEK (4 89) AND ROMAN (6 440)

Archaic (Attic) Greek.

The Great Age of Greek Sculpture.

a. The work of Myron and Polycleitus, and of Pheidias (6 153; 4 89; 3 228; 1-12; 5 510; 7-1, 523), greatest of Greek sculptors. “Discus Thrower” of Myron (4 84 illus.); statue of Zeus by Pheidias (4 74 illus. f.); Parthenon frieze (2 89 illus.; 4 90 illus.); the Venus de Milo (4 87 illus.; 5 47 illus.); Erechtheion Caryatides (4 73 illus. f.).

b. The work of Praxiteles (4 90), Scopas (4 90), and Lysippus (4 90), the “Hermes” of Praxiteles (4 85 illus.). To this period, too, belongs the Alexander sarcophagus (1 99 illus.).

Later Greek and Roman Sculpture. Despite a gradual loss of directness and simplicity and an increasing tendency towards realism, affectation, and ostentation, the Greeks produced many beautiful works in the 4th century B.C., and the Romans created fine portrait statues before art was extinguished in the West about the 4th century A.D.; Etruscan work influenced them.

a. Late Greek Sculpture: “Dying Gaul” (4-91).

b. Roman Sculpture, influenced by that of the Greeks (6 441 illus., 442 illus., 443 illus., 444 illus.).

V. MEDIEVAL AND RENAISSANCE.

Medieval (6-520).

a. Byzantine. (Chiefly carving and small works, often of great beauty (2 150 illus.).

b. Early Gothic. Sculpture in the early Christian centuries, hampered by literal interpretation of the commandment against making “any graven image,” was confined chiefly to sarcophagi, crucifixes, and objects for the adornment and use of the Church. With the rise of Romanesque and Gothic cathedrals and churches, sculpture was more

SCULPTURE

and more freely used as an adjunct to architecture. Early Gothic artists worked "for the glory of God" and not for fame, and their names are lost. Many religious sculptures—for example, the Irish Romanesque croziers—show various stages of artistic development.

c. Late Gothic in Italy. Many of the Italian sculptors of this period were painters and architects as well. Such were Niccolò Pisano (*f.i.*), whose work shows a study of the antique and thus foreshadows the Renaissance; Giovanni Pisano (*f.i.*), son of Niccolò; and Andrea Pisano (*f.i.*), pupil of Giovanni.

B. Renaissance (6-384).

a. Italian Renaissance. Among the great sculptors of the Renaissance were Ghiberti (*f.i.*; 3-392); Donatello (4-320; 6-519 illus.); the Della Robbias (4-320; 6-385 illus.); Verrocchio (4-320, 328 illus.); Leonardo da Vinci (4-482); Michelangelo (5-190; 4-327 illus.; 3-53 illus.); Benvenuto Cellini (4-320, 328 illus.; 6-386, 128 illus.); Torrigiano (6-385 illus.); Giovanni da Bologna (*f.i.*).

b. French Renaissance. The Renaissance dawned late in France. Jean Goujon and Germain Pilon were its most important sculptors, and their work, though graceful and often vigorous, shows the florid affectation of a declining age.

VI. "BAROQUE" AND THE LATE CLASSICAL REVIVAL.

A. "Baroque" (6-524). In Post-Renaissance sculpture (17th-century) statuesque dignity gave way to violent fluttering movement and florid excesses. The chief sculptor and architect of this period was the Italian J. L. Bernini (*f.i.*; 1-183 illus.; 6-228 illus.), a man of great talent and versatility, who filled Rome with "an almost incredible quantity of sculpture of the most varying degrees of merit and hideousness." From Italy this movement spread all over Europe.

B. Classicist Revival. A period of cold formal classicism followed the extravagances of the "baroque" style. The leading figures in this movement were Canova (6-524), an Italian sculptor, and Thorvaldsen, a Dane (6-524). John Flaxman (*f.i.*; 6-524) was a notable follower of this manner in Britain.

VII. NINETEENTH AND TWENTIETH CENTURIES.

A. The Nineteenth Century.

a. In France especially a new, more living sculpture sprang up in revolt against the

classical manner. This was led by such men as Barye (*f.i.*) and, in Britain, by Alfred Stevens (6-524). Gradually, too, even greater freedom began to show itself.

b. The outcome of the reaction from pure "naturalism" was the work of Auguste Rodin (6-425, 524) which began in Impressionism.

B. The Twentieth Century.

a. On the Continent. From Rodin onwards, sculpture developed rapidly, and each successive school of painting was reflected in its sister art. The work of Ivan Mestrovich (*f.i.*; 6-520 illus.) is typical of much fine 20th-century work.

b. In Britain. Although a majority of sculptors continued in the academic tradition, as exemplified by the work of Sir George Frampton (*f.i.*; 1-372), others turned to more original styles. C. S. Jagger (*f.i.*; 6-523 illus.; 7-10 illus.) and Eric Gill (6-522 illus.) show two types of development, the latter being especially moved by religious feeling and interest in the classicism of Rome. Sir Jacob Epstein (3-294) had tremendous influence, both in his large architectural works (6-523 illus.) and in his smaller, finely modelled portrait busts. Frank Dobson (6-524), Barbara Hepworth (6-524), Henry Moore (6-522 illus.) showed abstract, at times Surrealist (3-449), influence.

VIII. ORIENTAL.

A. Indian (4-245). In India, sculpture went back to thousands of years B.C., being at one time influenced by Greek invaders (4-249 illus.). In general, it is a naturalistic style tending toward the monstrous and exuberant (4-248 illus.).

B. Chinese and Japanese.

a. The Chinese have practised sculpture in stone from early times, and with the rise of Buddhism a school of sculptors sprang up, but their art was much influenced by Indian models (2-215 illus.). The real beauty of Chinese sculpture lies in the exquisite bronzes and ivory carvings of the Golden Age, which have influenced the art of many lands.

b. The Japanese (4-351; 5-121) seem to find little beauty in the human figure. Yet the "Nara school" (6th to 12th century A.D.) ranks with the Florentine school of European sculpture. As elsewhere in the Orient, religion had the greatest influence on sculpture (2-107 illus.).

Interest-Questions in Sculpture

What is "relief" in sculpture and what is its opposite? 6-519

What is plastic sculpture? 6-519

With what Italian city is Michelangelo especially associated? 5-190

Who is the greatest known ancient Greek sculptor? 4-80

Where is the horse first represented in sculpture? 3-197

Where is the Venus de Milo to be seen? 4-90

When is a piece of sculpture said to be "glyptic"? 6-519

Which Italian sculptor is associated with Henry VII's tomb in Westminster Abbey, London? 6-385 illus.

Did the ancient Greeks use colour in their sculpture? 4-89

What does the celebrated Leocote group depict? 4-91

Which famous sculptor designed the tomb of Pope Julius II at Rome? 5-190

In what respect did the ancient Romans show originality in their sculpture? 6-440

Of what metal is the figure of "Eros" in Piccadilly Circus, London? 6-521 f

Who designed "Rima" and what does it represent? 3-294

A sculptured group by Henry Moore stands in Battersea Park, London. What does it represent? 6-522 f.

A celebrated French sculptor made his reputation in 1877. Who was he, and what was the name of his exhibit? 6-426

SOCIAL SCIENCES

THE social sciences cover those branches of knowledge that deal with the problems of men in their relations with one another. They treat of human conduct and of the influences that shape it, and are usually divided into Sociology, Economics (3-159), and political science, that is, Government (4-49) and Politics (6-254).

The name sociology is often applied broadly to the whole group of social sciences, but in its more restricted sense it deals with those phases of human conduct that are governed by usage and custom rather than those that are the outgrowth of political or economic necessity; it seeks to investigate the "social habits" of the human race and their effects upon human welfare. Economics deals with the activities of men in producing, distributing, and consuming the valuable things of the earth. Political science deals with the organization and life of the State. The name "civics" is often given to that department of political science which deals with the practical machinery of government and with men's duties as citizens. All these human activities have developed against the background of Geography (3-513; 8-83) and History (4-180; 8-117).

SOCIOLOGY

I. ANTHROPOLOGY.

The study of Man's physical development, his place in Nature, and the origin of culture, with particular reference to primitive life and the survival of primitive modes of living and methods of thought. Anthropometry, the science dealing with the physical measurements of the different groups of mankind, is a branch of anthropology (*f. i.*). Read the article on Man (5-104).

II. ETHNOLOGY.

The study of the various blood-groups and their customs, with a view to finding out their origin and relationships.

- A. Divisions of Mankind (6-333).
- B. Cave-dwellers (2-282).
- C. Stone Age (7-161).
- D. Superstitions and Magic (5-77).
- E. Mythology (5-312).

III. PHILOLOGY (6-158).

The science which deals with the formation of languages (4-445). By the study of words used by early peoples, scientists have been able to ascertain many important things about the people who made the words and their mode of life. See *also* Alphabet (1-119).

IV. CUSTOMS AND INSTITUTIONS.

- A. Family: first important social unit. Clan (2-406); tribe; marriage (5-133).
- B. Origin of names (5-314); nicknames (5-433).
- C. Magic (5-77) and Witchcraft (7-464).
- D. Folklore (3-405).
- E. Architecture (1-209), and what it tells of human progress.
- F. Clothes (2-420) and Adornment.
 - a. Tattooing (7-230).
 - b. Armour (1-243).
 - c. Boots and shoes of different periods and lands (2-13).
 - d. Hats and caps (4-136) and their history.
 - e. Buttons (2-146) and how they came into use.
 - f. Lace (4-435) and its history.

- g. Orders and decorations (5-529).
- h. Crowns (2-530) and coronets (*f. i.*).
- i. Heraldry (4-164).

G. Etiquette (3-302): the essentials of good manners as established by custom.

H. Holidays and Festivals (4-186); Calendar (2-174).

- a. Christmas (2-381), and its celebration in different countries.
- b. Easter (3-154): its significance, and customs connected with it.
- c. Hallowe'en (4-119, 134) and superstitions associated with it.
- d. New Year's Day (5-409) in various parts of the world.
- e. Eisteddfodau (3-207).
- f. The Passover (6-94).
- g. The Sabbath (6-483).
- h. Harvest home (4-134).
- i. Coronation of the Sovereign (2-509).
- j. St. Valentine's Day (7-374).

V. AMUSEMENTS, GAMES, AND SPORTS.

A. Olympic Games, ancient and modern (5-508).

B. Gladiatorial Combats of the Romans (4-25; 2-404).

D. Modern Sports and Games.

- a. Outdoor Games: badminton (1-346); baseball (1-377); basket ball (1-378); bowls (2-29); cricket (2-528); curling (3-12); fives (3-385); football (3-414); golf (4-44); hockey (4-183); hurling (4-210); lacrosse (4-435); lawn tennis (4-460); netball (5-369); quoits (6-326); etc.
- b. Sports: bathing (1-384); boxing (2-29); cycling (3-14); motor-cycling (5-273); gliding (4-33); hunting (4-209); riding (6-400); skating (7-59); swimming and diving (7-207); etc.
- c. Indoor Pastimes: billiards (1-445); games with playing cards (2-221); chess (2-328); dancing (3-37); darts (3-50); dominoes (3-107); draughts (3-122); stamp collecting (7-143); etc.

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- E. The Drama (3-114) and the Theatre (7-263).**
 a. Morality plays of the Middle Ages (3 118, 117 illus.).
 b. Ballet (1 351).
 c. Pantomime (6 60); Punch and Judy (6-308); * puppets (6-310).
 d. Cinema (2-389).
 e. Broadcasting (6 340) and television (7-251).

VI. SOCIAL ORGANIZATIONS.

In the complicated social life of to day one great branch of Man's activities centres about clubs (2 423) and other societies formed for the pursuit of a common interest.

- A. Religious Organizations.**
 a. Crusading Orders (4 418; 3 2 with illus.).
 b. Monasticism (5-243, 485).
 c. Salvation Army (6-493); Church Army (*f.i.*).
B. Fraternal Organizations.
 a. Friendly societies (*f.i.*).
 b. Trade unions (7-304).
 c. Freemasonry (3 464).
C. Boys' and Girls' Societies.
 a. Boys' Brigade (*f.i.*); Boy Scouts (2 33).
 b. Girl Guides (4 22).
 c. Youth Clubs (2-424).

VI. PROBLEMS OF SOCIOLOGY.

- A. Protection of the Weak.**
 a. Child Welfare: Children (2 336) and their education (3-166).

- b. Care of the poor, old, disabled, and unemployed; state insurance (4-271); retirement pensions (6-120); education of the blind (1 485); education of the deaf (3 56); etc.
 c. Care of defectives and delinquents.
 d. Prisons (6-290): places of punishment and of reform.

B. Preserving Health and the relief of suffering.

- a. Hospitals (4-199).
 b. National Health Service (*f.i.*).
 c. Factory and food inspection.
 d. Red Cross Societies (6-370).
 e. Nursing (5 485).

- C. Private Philanthropy.** Before public responsibility for the relief of suffering, the provision of education, and other social services was recognized, many private individuals contributed work and money to these ends, and have continued to do so.

Some Prominent Philanthropists: Florence Nightingale (5 437), founder of modern military and civilian nursing. Thomas Coram (*f.i.*) and the Foundling Hospital (*f.i.*), George Peabody (*f.i.*), and his buildings for working people; Thomas John Barnardo (1 369), friend of "street arabs"; General Booth (2 13), founder of the Salvation Army. Lord Shaftesbury (7 11); John D. Rockefeller (*f.i.*); Cecil Rhodes (6 393, 20); Andrew Carnegie (2 244); Alfred Nobel (5 445); Lord Nuffield (5 473; 6 18).

ECONOMICS

Economics (3 159) is a "bread-and-butter" study, dealing with the production, distribution, and exchange of all forms of wealth.

I. LAND.

Land is the basis of all wealth, because it is the source of all the raw materials of production. The share played by land in the production of wealth can be measured in terms of rent (3-159). The development of Agriculture (1 70) and its economic effect.

II. CAPITAL AND LABOUR.

The share of labour in the production of wealth is measured in wages; that of capital, or accumulated wealth, is measured in interest (3-160).

- A. Capital (3 160) and capitalism (*f.i.*).**
B. Division of labour.
C. Forced Labour—slavery (7-65) and serfdom (3-348; 7-65).
D. The Industrial Revolution (4-259) and growth of the factory system.
E. Organization of Labour: medieval guilds (4-103); modern trade unions (7-304).
F. Arbitration (*f.i.*) in labour disputes.
G. Socialism (7-81).
H. Communism (2 474).

III. MANAGEMENT (3-160).

Through the efforts of men of enterprise (managers),

land, labour, and capital are brought together and put to productive use.

IV. FINANCE.

The work of obtaining and using money and credit for the support of public and private enterprises

- A. Money (5 233).**
B. Credit (2 11) and Banking (1-363).
 a. Savings accounts (1 365).
 b. Banknotes (5-236; 1-362, 363).
 c. Cheques (1-364; 5 236).
 d. Interest (3-160).
 e. Bankruptcy (1-363).
 f. Foreign Exchange (3-418).
C. Public Finance.
 a. Taxation (7 230).
 1. Customs and excise (2-12).
 2. Stamp duties.
 3. Income tax (*f.i.*; 7-231) and death duties (7-231).
 4. Licences (6-272).
 b. National Debt.
 c. Gold Standard (4 43).
D. Stocks and shares (7-158).

V. PRODUCTION AND DISTRIBUTION.

- A. Organizations for Production and their regulation.**
 a. Companies.
 b. Trusts (*f.i.*).

SOCIAL SCIENCES

- c. Co-operative societies (2-499).
- d. Municipal undertakings.
- e. Nationalisation and government ownership.
- f. Building societies (*f.-i.*).
- B. Commerce and Transport.
 - a. Railways (6 354).
 - b. Ships (7 28).
 - c. Air transport (1 85).

- d. Roads (6 404).
- e. Post Office (6 270).
- f. Telegraphy (7-237); Telephones (7 240); cables (2 152); radio-telephony (6 352); etc.
- g. Fairs (3 336) and Markets.
- h. Hire Purchase.

VI. INSURANCE (4 271).

POLITICAL SCIENCE (Civics)

I. ORIGIN OF GOVERNMENT.

If Man were a solitary creature who did not come in contact with his fellows, he might do as he pleased without restraint, except by Nature. But Man early learned that it was to his advantage to live and work with his fellow-men, and found himself better able to survive and make progress in society than out of it. And so his liberty became limited by such rules as were necessary for the public good. An early social unit was the family; but it is not yet known whether this originated before or after the development of tribal or patriarchal government. By gradual evolution this early system gave place to the complex organization called the State, a term used primarily to designate any community having an independent existence and possessing a sovereign government. Government (4 49) is the machinery by which a State makes or enforces the rules of action necessary to enable men to live together in peace and security. It is the subject matter of Politics (6 254).

II. FORMS OF GOVERNMENT.

A. Monarchy. A government in which the sovereign authority is vested in one person, called a sovereign, monarch, king, emperor, etc., while those under his rule are called his subjects; it is usually hereditary, but may be elective. Monarchies are divided into two classes:

a. **Absolute Monarchy.** One in which the monarch's power is unlimited by any principles of government; it is sometimes called an autocracy, and if the rule is cruel or severe, a despotism or tyranny.

b. **Limited Monarchy.** One in which the ruler is limited in the exercise of his power by a constitution; it is also called a constitutional monarchy. Great Britain is an example; others are Denmark, Norway, Sweden, the Netherlands.

c. **Feudal System (3 348).** Under this system, the king was the nominal owner of all the land. It was distributed, however, as "fiefs" among his vassals, who owed him in return homage and military aid in time of need. These royal vassals in turn distributed their land in smaller fiefs to lesser vassals, and so on down.

B. **Aristocracy.** A State ruled by a few nobles; literally the name means "rule of the best," and the ideal aristocracy (as in Plato's "Republic") was controlled by a few men of superior wisdom. When those who held the power did so, not by virtue of character but by virtue of birth or wealth, and allowed their own selfish

interest to predominate, the aristocracy became an Oligarchy. In modern states the aristocracy plays an inconsiderable part in government as the Peerage (6-106).

C. **Democracy (3 69).** A government in which all the members of the State possess, at least in theory, an equal share of the sovereignty.

a. **Pure Democracy.** One in which the government is carried on directly by all the people of a community there were examples in ancient Greece (4 76; 1 288). This form is now found only among savage tribes and as a form of local government in small towns.

b. **Representative Democracy.** One in which the government is delegated to a body of men, elected by the citizens of the State. The vote is usually by ballot (1 356).

D. **Dictatorship.** A Dictator is a ruler exercising complete power over the state that accepts him, usually in a time of crisis. Dictatorships occurred in both ancient Greece and ancient Rome (6 430). Outstanding modern examples have been the Fascist régime (3 341; 4 316) in Italy under Benito Mussolini (5 310), and Nazism (5 328; 7 485) in Germany under Adolf Hitler (4 181).

E. **Communism (2 474) and Socialism (7-81).** Under these systems of government the State owns and controls for the benefit of every citizen all essential industries and means of distribution. The Communist government of Russia (6 473) claims that that country is one stage on the way to the perfect society in which all outward forms of government would wither away.

F. **Anarchism.** This demands the complete abolition of the State as it exists to-day, substituting instead some form of industrial co-operation.

Note: A government may be single or unitary; that is, it may consist of a single State in which there is single sovereignty; or it may be federal, consisting of a union of States which have surrendered their right to act independently in matters pertaining to the common interest, while in other respects they have retained complete independence. France, for example, has a unitary government. The United States of America, Australia, the Soviet Union, and the Republic of India are among countries having federal governments.

III. CONSTITUTIONS.

With the wane of absolute monarchies and the growing tendency towards democracy, the authority of rulers came to be limited or defined. The first

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such limitation in England took the form of a charter, the famous Magna Carta (5-80), granted to the English barons in 1215 by King John (4-378). Other historic documents of the kind are the Bill of Rights (1-446); the constitution of the United States of America, which came into effect in 1789 (7-361); and the constitution proclaimed in the same year by the French Assembly which included the immortal "Declaration of the Rights of Man" (1-446). A constitution may be either written or unwritten.

IV. FUNCTIONS OF GOVERNMENT.

A government, no matter what its form may be, has three functions: legislative, judicial, and executive.

A. Legislative Branch. The legislative branch of a government makes the laws. In countries which, like Britain, have a parliamentary form of government, the line between the legislative and executive branches is not very clearly drawn, but in the United States of America, for instance, the legislative branch is sharply separated from the executive branch of the government.

a. Law (4-457); Roman law (6-440); the Code Napoléon (3-452).

b. British Parliament (6-86): the law-making body for the British Isles and the Crown Colonies, and one of the oldest legislative assemblies in existence. *See also* Cabinet (2-151).

B. Executive Branch, or Civil Service (2-405): that branch of government which administers and enforces the laws.

C. Judicial Branch or Judiciary: that branch of government which applies and interprets the laws (statute or common).

a. Courts of Justice (2-520): their criminal and civil functions; different classes of courts.

1. Habeas Corpus (4-115).

2. Jury (4-387).

3. Prisons and Punishments (6-290).

b. Police (6-247).

D. Taxation (7-230): How a government obtains money to conduct its affairs; how a tax is levied; different kinds of taxes.

V. POLITICAL PARTIES.

In parliamentary constitutions, a large part in the working of the political machine is played by parties, i.e., organizations of men and women who have joined together to promote the political aims they have in common. In Britain the principal parties are the Conservative (or Tory) Party (2-487); the Labour Party (4-427), which believes in Socialism (7-81); and the Liberal Party (4-485), whose aim is reform within the existing system.

VI. INTERNATIONAL LAW (4-459).

A. Geneva Convention (6-370).

B. The Hague courts of international justice (4-459).

C. Some Rules of War.

a. Blockade (*f.i.*).

b. Red Cross activities in war (6-370).

c. War Crimes (4-460).

D. The League of Nations (4-463).

E. The United Nations (7-354).

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Classification of Animals

THE members of the animal kingdom present a far greater variety of structure and function than those of the plant kingdom, for the conditions of animal life are less fixed and stable than those of plant life. Most plants obtain their food directly from the air and the soil; animals are for the most part compelled to move about in search of food and to adjust themselves to a far greater variety of diet. The struggle between animals for survival is more violent and active than between plants, so that the means of attack and escape are much more highly developed and versatile. Because of the greater variety of forms, animals are even more difficult to classify than plants. Differences of opinion exist among authorities, and systems of classification are subject to change from year to year. The tendency, however, is always to arrive at a classification that will bring out the *natural evolutionary relationships* between animals. The method followed here is based upon the best established systems, with the omission of many of the less important subdivisions. Consult introduction to the Botany Outline for key to abbreviations (8-70); read also the main article on the Animal Kingdom (1-154); Zoology (7-523); Evolution (3-321); Marine Life (5-127).

Phylum I. PROTOZOA (6-298).

This is an unnatural classification consisting principally of microscopic, unicellular, aquatic organisms of primitive and simple form. It is equivalent to the Protophyta among the plants (8-70), and like that group contains a number of forms allotted to animals and plants alike. The following classification, based chiefly on organs

of locomotion, is an artificial one; only the more important groups are indicated.

Cl. Mastigophora (Flagellata): move by means of a whip-like "flagellum." Numerous orders including:

Ord. Euglenoidina: one or two flagella type, *Euglena*, common in stagnant fresh water to which they give green colour.

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Ord. **Dinoflagellata** : two flagella, often cellulose armour; many parasitic types. *Noctiluca* is a phosphorescent form found at sea.

Ord. **Phytoflagellata** : high forms multicellular; often claimed as plants (8-70). Types: *Ohlomydomonas*; *Volvox*.

Ord. **Protomonadina** : parasitic forms: *Trypanosoma*, parasite that causes sleeping sickness (4-15; 7-323).

Cl. **Rhizopoda** : move by means of "pseudopodia," outgrowths of the cell substance.

Ord. **Amoebina** : *Amoeba* (1-140), a typical example.

Ord. **Foraminifera** (2-299; 6-298; 5-127 illus.); larger forms with complex calcareous shell. Examples: *Polystomella*; *Globigerina*, found in plankton; *Nummulites* (a common fossil "giant" form).

Ord. **Radiolaria** (1-450; 6-298) : large forms with radiating, siliceous skeleton, living in marine plankton (*f.i.*).

Ord. **Mycetozoa** : slime fungi, forming gigantic amoeba-like masses such as "flowers of tan," *Fuligo varians*.

Cl. **Sporozoa** : parasitic forms. Sub. cl. **Telosporidia** typified by Ord. **Haemosporidia**, including malaria parasite, *Plasmodium*.

Sub-cl. **Neosporidia** (Sporozoa) : genus *Nosema* causes some diseases of bees and silkworms.

Cl. **Ciliophora** : move by means of "cilia," numerous minute hairs.

Ord. **Ciliata** (Infusoria) contains numerous forms common in pond water; *Paramecium* (1-157 illus., no. 1); *Vorticella* or bell animalcule, etc.

Note : The animals from this point on are called collectively **Metazoa**, meaning "advanced" forms, as distinguished from **Protozoa**, meaning "primitive" forms. While most of the Protozoa are single-celled, the Metazoa consist of groups of cells.

Phylum II. PORIFERA.

The Sponges (7-137). Sac-like body of connective tissue with single opening; food through pores in body wall. Have "skeletons," or stiffening matter, arranged in "spicules." Typical classes: **Hexactinellida**, skeleton of silica rods (Venus's flower basket, glass-rope sponges); **Calcarea**, skeleton of carbonate of lime; **Demospongiae**, mixed types, skeleton of silica or spongin or both (cup sponges, horny or bath sponges, boring sponges).

Note : Some authorities give the sponges rank as a separate sub-kingdom, **Parazoa**, divided into Phylum I (*Nuda*), to which belong the **Hexactinellida**, and Phylum II (*Gelatinosa*) containing all other sponges.

Phylum III. COELENTERATA.

Sac-like body; food swept into single orifice or "mouth" by fringe of tentacles; rudimentary sense organs, nerve cells, either scattered throughout body or forming connected system.

Cl. **Hydrozoa** : Primitive types, tubular or umbrella-shaped. Typical orders: **Hydroida**,

least developed forms (genus *Hydra*, 4-213); **Hydrocorallinae**, which gather into coral-like colonies with limy skeletons (millepore coral, 5-128 illus. *f.*); **Siphonophora**, attached to floating bladders or air-sacs (genus *Physalia*, Portuguese man-of-war, 4-360 with illus. *f.*).

Cl. **Scyphozoa** : body umbrella-shaped; specialised reproductive and sense organs. Typical order : **Discomedusae** ; genus *Aurelia*, common jelly-fish (4-360).

Cl. **Anthozoa** (**Actinozoa**) : individual forms (*e.g.* sea anemones) and colonial forms (*e.g.* corals). Have oesophagus and primitive muscular tissue in tentacles; colonial types have stiffening matter of carbonate of lime or horny matter.

Sub-cl. **Alcyonaria** : eight tentacles. Typical families: **Pennatulidae**, sea-pens, with feather-shaped upper end; **Gorgoniidae**, sea-fans (3-frontis.), sea-whips, and precious coral of Mediterranean (2-504).

Sub-cl. **Zoantharia** : forms with variable structure. Includes order **Actiniidae**, divisible into sub-orders **Actinaria**, sea anemones (6-524; 3-frontis.; 1-157 illus.; 5-129 illus.), and **Madreporaria**, madreporic corals.

Phylum IV. CTENOPHORA.

Transparent, delicate jelly-fish, but not related closely to Coelenterates.

Phylum V. PLATYHELMINTHES.

Flatworms (1-154, 157 illus.); mainly parasitic. Alimentary canal and nervous system well developed; rudimentary blood vessels and muscles.

Cl. **Turbellaria**, aquatic, ciliated types; Cl. **Trematoda**, parasitic upon animals (genus *Distomum*, the liver fluke); Cl. **Cestoda**, tapeworms.

Phylum VI. NEMERTINA.

Small group of unsegmented marine "worms."

Phylum VII. ROTIFERA.

Wheel animalcules. Microscopic; have "wheel" of cilia about free end; have points of similarity to flat worms, primitive ringed-worms, and molluscs.

Phylum VIII. CHAETOGNATHA.

Bristles about mouth, fins on tail (genus *Sagitta*, a sea worm).

Phylum IX. ACANTHOCEPHALA.

Cylindrical parasitic forms possibly related to Phylum X.

Phylum X. NEMATHELMINTHES.

Round-worms (7-500); muscular, sucking oesophagus, thick skin, parasitic in plants and animals.

Cl. **Nematoda** : thread-shaped, from microscopic length to 1 yard long; frequently parasitic, disease-causing forms. Typical genera: *Ascaris*, round-worm; *Oxyuris*, pinworm;

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Ankylostoma, hookworm; *Trichina*, cause of trichinosis; *Filaria*, cause of elephantiasis.

Ord. Gordiacea : hairy worms; typified by horse-hair worm.

Phylum XI. ANNELIDA (Chaetopoda).

Ringed worms (7 500): cylindrical; body segmented or "ringed"; usually locomotion by bristles. (Classes: **Polychaeta**, marine types; **Oligochaeta**, fresh-water and soil types (Earth-worm, 3 153). **Hiradinei**: have suckers instead of bristles for locomotion; the leeches (7-500).

Phylum XII. ARTHROPODA.

Resemble annelid worms in segmentation of body, but appendages are jointed to segments; heavily armoured with chitin; nervous structure resembles spinal cord; organs highly developed. The Arthropods are divided into five main living classes: (1) **Crustacea**, lobsters, crabs, shrimps, and barnacles; (2) **Arachnida**, scorpions, spiders, and mites; (3) **Diplopoda**, millipedes; (4) **Chilopoda**, centipedes; (5) **Hexapoda** or **Insecta**, insects. In addition, there is the small class **Onychophora**, consisting of the strange caterpillar-like *Peripatus*, and considered to be in many ways ancestral; and the small group of spider-like marine creatures, the class **Pycnogonida**.

Note: Because of the vast size and many subdivisions of the phylum Arthropoda, considerable space has had to be devoted to each of its divisions.

Class CRUSTACEA, Crustaceans.

Chitinous shell strengthened with lime; gills (modified for air-breathing in land types); appendages develop several branches in swimming types; have horny carapace or "shell" over combined head and thorax (cephalothorax).

Sub-cl. **Branchiopoda**: primitive, aquatic forms; typical order, **Cladocera**, including water-fleas. The sub-classes **Ostracoda** and **Copepoda** contain a large variety of usually small marine forms. These, with the **Branchiopoda** and **Cirripedia**, were formerly grouped as one heterogeneous sub-class, **Entomostraca**. Sub-cl. **Cirripedia**: degenerate, parasitic types. Barnacles (1 369): *Sacculina* (f.i.).

Sub-cl. **Malacostraca**: have 20 or 21 body segments; most types have eyes on stalks. Principal order: **Decapoda** ("ten-footed"). Five segments of thorax have walking legs; have strong pincer-like grasping claws (chelae).

Sub-ord. **Macrura**: abdomen large, long. Typical families: **Homaridae**, lobsters (4-583); **Crangonidae**, shrimps (7 44); **Palaeomonidae**, prawns (7 44); **Astacidae**, crayfish (2 526); **Paguridae**, hermit crabs (2-523 illus.).

Sub-ord. **Brachyura**: true crabs (2 523); abdomen short or rudimentary; includes common crabs, spider crabs, and land crabs.

Class ARACHNIDA (Scorpions, Spiders, Mites).

Cephalothorax (fused head and thorax) bears six pairs of appendages, the first two used for grasping, last four pairs as legs. Land forms have either

lungs, or tracheae (tubes passing air through the body), or both. Among extinct members of this class are grouped the trilobites and eurypterids. The king-crabs, *Xiphosura* (f.i.), are grouped here rather than in the Crustacea. Apart from these, there are generally considered to be two sub-classes:

Sub-cl. **Pectinifera**: possessing a pair of pectinei or combs formed from abdominal appendages; tail-end of body elongated.

Ord. **Scorpiones**, scorpions (6 509)

Sub-cl. **Epectinata**: no pectinei, rear end not elongated.

Super-ord. **Caulogastra**: abdomen constricted from cephalothorax by narrow waist or "pedicel."

Ord. **Pedipalpi**: whip-scorpions.

Ord. **Araneae**: spiders (7 132); have silk glands (spinnerets). Typical families: **Theraphosidae** or **Mygalidae**, including "bird-eating" spiders and trap-door spiders; **Lycosidae**, wolf spiders, tarantula (7 227); **Argyronetidae**, water spider (7 134; 5 335 illus.); **Attidæ**, leaping spiders; **Argiopidae** or **Epeiridae**, including common garden spiders; **Agelenidae**, labyrinth spiders.

Super-ord. **Pseudoscorpiones**: no "waist," silk glands open on to mandibles. "Book-scorpions."

Super-ord. **Phalangiomorphae**: Includes **Phalangidae**, "harvest men," with pill-like body, long slender legs.

Super-ord. **Rhyncostomi**: Order **Acari**: mites. Abdomen fused with cephalothorax; mouth formed into sucking beak. Includes red mites, water mites, ticks, "itch" parasites, cheese mites, follicle mites; Fam. **Eriophyidae** are the gall-mites of plants.

Class DIPLOPODA (Millipedes).

Body cylindrical, divided into numerous segments, each two segments covered by single plate, making it appear as if two pairs of legs spring from each segment (hence "Diplopoda," meaning double footed); internal anatomy differs markedly from that of centipedes.

Class CHILOPODA (Centipedes).

Centipedes (2-291) resemble insects except for numerous segments of body and many legs.

Note: Some authorities retain a class **Myriapoda**, which includes millipedes in sub-class **Diplopoda** and centipedes in sub-class **Chilopoda**.

Class HEXAPODA or Insecta (Insects).

The insects (4 264) are distinguished from other Arthropoda by having (in the final stage) 3 pairs of legs. Head, body, and abdomen are separate; they breathe by tracheae (air tubes). The manner in which the young develop leads to a division of insects into two sub-classes: (1) **Apterygota**; (2) **Pterygota**.

Sub-cl. **Apterygota**: new-born young closely resemble parents. Orders: **Thysanura**, primitive, wingless forms, including *Mallochia*, the

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"silver-fish"; *Collembola*, the spring tails.

Sub-cl. **Pterygota**, with two divisions:

Division 1. **Exopterygota**: young (nymphs) superficially resemble parents, but with wings undeveloped; some orders show partial metamorphosis (*f.-i.*).

Ord. **Orthoptera**: "straight-winged," the front pair stiffened into covers; mouth adapted for biting and chewing. Includes three sub-orders: (1) *Cursoria* or "runners" such as cockroaches (2-439; 4-269 illus.); (2) *Gressoria* or "walkers" such as mantis (5 116); stick insects (4-265 illus.; 6 296 illus. *f.*); and leaf insects (4 266; 6 296 illus. *f.*); (3) *Saltatoria* or "jumpers" such as grasshoppers (4-64), locusts (5-14), and crickets (2 531); also the mole cricket (2-531).

Ord. **Dermaptera**: front wings hardened into covers but wings sometimes absent; tip of abdomen bears pincers. Typical family: *Forficulidae*, earwigs (3-154).

Ord. **Plecoptera**: stone flies; nymphs aquatic, with gills.

Ord. **Ephemeroptera**: consists of a single family *Ephemeridae*, may-flies (5-150).

Ord. **Odonata**: dragon flies (3-112), strong biting jaws; nymphs aquatic.

Ord. **Isoptera**: social habits similar to ants, but otherwise different. White ants or termites (7 259; 1-661 illus. *f.*).

Ord. **Embiopoda**: small, gregarious or semi-social insects.

Ord. **Psocoptera** (*Corrodentia*): very small forms, biting mouth parts. Single family *Psocidae*, book lice.

Ord. **Anoplura**: very small, flattened, wingless forms; parasitic.

Sub-ord. *Siphunculata*, sucking mouth parts, lice.

Sub-ord. *Mallophaga*, biting mouth parts, bird-lice (6-78).

Ord. **Thysanoptera**: thrips; small forms with hairy wings; sucking mouth.

Ord. **Hemiptera**: true bugs; mouth parts developed for piercing and sucking. Divided into sub-orders: (1) *Heteroptera*, fore and hind wings of different types, as in the water bugs, bed bugs; (2) *Homoptera*, all four wings similar, as in cicadas (2 387); aphids (1-182); scale insects (*f.-i.*); grasshoppers (4-269 illus.); and cochineal (2 436).

Division 2. **Endopterygota**: young (larvae) undergo complete metamorphosis with resting (pupal) stage; illustrated in mosquito (5-271); butterfly (2-136).

Ord. **Neuroptera**: membranous, net-veined wings; usually carnivorous on other insects. Examples, ant-lions (1-178); lace-wing flies (*f.-i.*); lantern flies.

Ord. **Coleoptera**: beetles (1-412); fore wings hardened as "elytra," wing-covers;

biting mouth-parts. Sub-ord. **Adephaga** includes ground beetles, tiger beetles, water beetles; all predaceous forms. Sub-ord. **Polyphaga** includes rest of beetles, in six super-families: (1) *Staphylinoidea*, rove beetles, devil's coach horse (*f.-i.*); (2) *Diversicornia*: burying beetles; lady-birds (4-436); glow-worm (4-36); click beetles (1-414); "death-watch" (1-414); (3) *Heteromera*, blister beetles, "Spanish fly"; (4) *Phytophaga*, leaf-eating beetles, long-horns, wood-borers; (5) *Rhyncophora*, weevils (7-435); (6) *Lamellicornia*, cock-chafers; scarabs, dor beetles, stag beetles.

Ord. **Strepsiptera**: minute forms, female-parasitic on other insects; example, *Stylops*, the bee louse.

Ord. **Mecoptera**: scorpion flies; family *Panorpidae*; pupa free-living; transparent, net-veined wings.

Ord. **Trichoptera**: caddis flies; larvae aquatic, live in tubes of sand, stones or sticks.

Ord. **Lepidoptera**: butterflies and moths, (2-136). Scales on wings; larvae usually "caterpillars" (2-263).

Sub-ord. *Homoneura*: primitive forms, including swift moths (*Hepialus*).

Sub-ord. *Heteroneura*: venation of fore and hind wings different, not same as in *Homoneura*.

Super-fam. *Cossoidea*: goat moth, larva bores in trees.

Super-fam. *Tineoidea*: clothes moths; boll-worm of cotton, *Pectinophora*, etc.

Super-fam. *Pyraloidea*: small forms, including *Ephestia*, flour moths.

Super-fam. *Psychoidea*: genus *Zygæna*, burnet moths.

Super-fam. *Lasiocampoidea*: egg-worm moths; vapourer; lackey moth (*f.-i.*).

Super-fam. *Noctuoidea*: principally night-flying moths, including "cut-worms" and "army-worms"; fam. *Arctiidae*: "woolly-bears," tiger moths (2 143 illus.; 263 illus.).

Super-fam. *Notodontoidea*: puss-moth; hawk moths. Fam. *Sphingidae*; group *Geometrina* have "looper" larvae; winter moths (7-461).

Super-fam. *Bombycoidea*: Silk-worms (*f.-i.*); atlas moths (2-142 illus.).

Super-fam. *Papilionoidea*: all the butterflies. Fam. *Papilionidae*, swallow-tails (2-137, 138 illus., 263 illus.); *Nymphalidae*, peacocks, tortoise-shells, etc.; *Pieridae*, whites, etc.; *Lycaenidae*, blues; *Argynnidae*, fritillaries (*f.-i.*).

Note: The old grouping of the *Lepidoptera* into *Rhopalocera*, butterflies, and *Heterocera*, moths, was not founded on scientific evidence; nor is that adopted by collectors of dividing the order into *Micro-* (small) and *Macro-* (large) *lepidoptera*.

Ord. **Diptera**: true flies (3-401), distinguished by having only one pair of wings, the rear pair being represented by

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"halteres," balancers. Two sub-orders: (1) *Nematocera*, forms with long antennae, larva has obvious head, includes fam. *Tipulidae*, daddy-long-legs (*f.-i.*); fam. *Culicidae*, gnats (3-172), mosquitoes (5-271); and various families of midges. (2) *Brachycera*, antennae short, larva has no evident head; two groups, (1) *Orthorrhapha*, pupa free; horse flies, robber flies, bee-flies; (2) *Cyclorrhapha*, pupa enclosed in puparium; hover flies (4-267 illus.), house flies (4-264), and bluebottles; sheep ked or tick belongs to super-fam. *Pupipara*, in which larvae are born ready to pupate from body of female. The tsetse fly (7-323) also reproduces in this manner.

Ord. *Siphonaptera* (*Aphaniptera*); fleas (3-388); wingless; larvae free-living, adults semi-parasitic, sucking mouth-parts.

Ord. *Hymenoptera*: four membranous wings; higher forms most highly developed of all insects. Has two sub-orders:

Sub-ord. *Symphyla*: sawflies (6-501), primitive types with no waist constriction.

Sub-ord. *Apocrita*: with constricted waists; divided into seven super-families, first three of which are termed *Parasitica*, rest *Aculeata*, being armed with stings.

1. *Cynipoidea*: gall flies (*f.-i.*). Lay eggs in plant tissue, producing "gall."

2. *Chalcidoidea*: usually bright metallic colours; include fig wasps (3-351), but chiefly parasitic on other insects.

3. *Ichneumonoidea*: ichneumon flies (4-234); long, curved ovipositors, for laying eggs in larvae of other insects.

4. *Vespoidea*: wasps (7-423). Typical families: *Vespidae*, social wasps, including hornets (4-195); *Eumemidae*, solitary potter wasps (4-269 illus.); *Ammophila*, sand wasps (7-424); *Odynerus*, mud wasp; *Mutillidae*, solitary, females wingless, ant-like, parasitic.

5. *Sphecoidea*: mud-dauber wasps; solitary types, usually preying on other insects.

6. *Apoidea*: bees (1-405); honey feeders. Typical families: *Apidae*, hive bees, tongue short, social life highly organized; *Bombidae*, bumble bees, tongue long, make "honey-pots" instead of combs; *Megachilidae*, solitary mason bees, leaf-cutter bees (*f.-i.*), potter bees; *Xylocopidae*, carpenter bees (1-407, 409 illus., 269 illus.); *Andrenidae*, burrowing bees.

7. *Formicoidea*: ants (1-160); females differentiated into queens and workers; social life highly organized. Social ants form a single great family, *Formicidae*.

Phylum XIII. MOLLUSCA.

Molluscs (5-232): specialised mouth, eyes, gills or primitive lungs, digestive tract, heart and blood vessels, nervous system. Most forms have

"mantle" or fold of skin secreting shell on the outer surface.

Cl. *Amphineura*: primitive types, especially the wormlike forms without shells. Shelled type, with eight plates, enabling animal to roll into ball, include chitons.

Cl. *Gastropoda*: usually snail-like type (5-232); conical or spiral shell; foot usually creeping sole; primitive eyes; gills in water types, lungs in land types; heart, nerves, and muscles; rasp-like palate. The following is one of several classifications of this group:

Ord. *Prosobranchia* (*Streptoneura*): gills.

Typical families: *Patellidae*, limpets (5-232 illus. *f.*; 7-24 illus. *f.*), ring-like gills.

Haliotidae, abalones, two comb-like gills.

Muricidae, secrete valuable purplish dye.

Buccinidae, whelks, carnivorous; *Cypraeidae*, cowries, carnivorous; *Ampullaridae*,

ampulla or "watering pot" shell; *Littorinidae*, periwinkles; *Tritoniidae*, Tritons,

turret-like siphonated shells; *Strombidae*,

foot narrow, soleless, conches, wing shell.

Ord. *Pulmonata*: lungs, consisting of

cavity with network of blood vessels.

Typical families: *Helicidae*, snails (7-73)

Limacidae, slugs, shell reduced (7-73)

Limnaeidae, pond snails.

Cl. *Scaphopoda*: tooth-shells; mantle secretes tusk-shaped shell; a small group.

Cl. *Lamellibranchiata* (*Pelecypoda*): bivalves (7-24; 6-24); mantle divided along back hinged shells.

Ord. *Filibranchia*: gill juncture non-vascular, ciliated. Typical genera: *Mytilus*, mussels (2-437; 5-232; 7-24 illus. *f.*), *Pecten*, free-swimming, eyes on edge of mantle, scallops (6-502).

Ord. *Eulamellibranchia*: gill juncture vascular. Typical genera: *Ostrea*, oysters (6-23); *Cardium*, cockle (2-437); *Venerus*, *Mya*, clams (2-437; 7-24); *Teredo* (*f.-i.*), boring types, shipworm; *Unio*, *Anodonta*, fresh-water mussels.

Cl. *Cephalopoda* (3-12; 4-370; 5-232): foot bent under and joined to head; tentacles surrounding mouth; shell rudimentary ("cuttlebone") or absent. Bodily structure highly organized; well-developed eyes.

Sub-Cl. *Tetrabranchia*: Primitive forms, organs grouped in fours; genus *Nautilus* only living type (5-232); Ord. *Ammonoidea*, ammonites (5-232; 3-425 illus.), common fossils.

Sub-Cl. *Dibranchia*: organs grouped twos.

Ord. *Decapoda*: ten tentacles. Examples, *Loligo*, common squid (3-13); *Sepia*, cuttlefish (3-12); *Architeuthis*, giant squid (3-13).

Ord. *Octopoda*: eight-armed. Typical families: *Octopodidae*, octopus (3-13); *Argonautidae*, argonaut or "paper nautilus," female has boat-like shell (1-22).

Phylum XIV. POLYZOA (BRYOZOA).

Live in colonies resembling some *Hydrozoans*; sometimes called "sea moss"; entirely aquatic.

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Phylum XV. PHORONIDEA.

Phylum XVI. GEPHYRAEA.

Phylum XV and Phylum XVI are two small phyla of marine creatures more highly evolved than those included in Phylum XIII (molluscs).

Phylum XVII. BRACHIOPODA.

Have mollusc-like shells; *Lingula*, lamp shell, has not changed since Cambrian times, and is one of the oldest living creatures.

Phylum XVIII. ECHINODERMATA.

Literally, "spiny-skinned" animals: starfish and sea-urchins (7-150); internal structure, like 5-rayed star, with alimentary canal as axis; skin has limy plates; body has "arms" for locomotion. Circulatory system, muscles, nerves, and sense organs present. Typical classes: Crinoidea, sea lilies, mouth turned upward, arms branched and fringed, lower surface attached to bottom by stalk; Asteroidea, five arms, mouth on lower surface (genus *Asterias*, common starfish); Ophiuroidea, brittle-stars; Echinoidea, sea urchins, globular; Holothuroidea, sea cucumbers (6-29), limy plates embedded, leaving surface leathery; axis horizontal instead of vertical.

Phylum XIX. CHORDATA.

Body-wall cylindrical, usually with appendages (fins, wings, limbs, etc.). Body stiffened in primitive forms by gristly rod called a *notochord*, lying along spinal cord; in higher forms notochord develops vertebrae of bone, many of them supporting ribs.

Sub-ph. **HEMICHORDA**: Worm-like body; short spinal column, connected by nerve collar to another system along abdomen. Typical genus, *Balanoglossus*.

Sub-ph. **UROCHORDA**: sea-squirts: usually have mollusc-like mantle or tunic containing cellulose; rudimentary heart.

Sub-ph. **CEPHALOCHORDA**: body pointed at both ends; only appendage, tail fin; internal structure extremely primitive; very small fish-like creatures, swimming or lying buried in sand. Typical of this group is the genus *Amphioxus*, the lancelet (*f.i.*).

Sub-ph. **VERTEBRATA** (Craniata): vertebrates (7-394). Notochord in embryo of all true vertebrates, and remains as cartilaginous skeleton among the lower fishes: higher types develop true bony skeleton.

The sub-phylum Craniata includes all members of the animal kingdom not listed above.

Scientists believe that the first vertebrates were primitive fishes; that certain of these fishes gave rise to the amphibians; that certain of the amphibians gave rise to the primitive reptiles; and that from these in turn were evolved the reptiles, birds, and mammals.

The vertebrates are divided into six classes: (1) Cyclostomata, lampreys, etc.; (2) Pisces, fishes; (3) Amphibia or Batrachia, amphibians; (4) Reptilia, reptiles; (5) Aves, birds;

(6) Mammalia, mammals. A detailed description of these classes, the most important in the animal kingdom, follows:

Class CYCLOSTOMATA (Lampreys, etc.).

Sucker mouth instead of jaws; primitive cartilaginous skull, spine consists of chord and notochord rod. Lampreys (4-441) and hagfishes (6-78).

Class PISCES (Fishes).

All fishes (3-377) are water dwellers, and are especially adapted to this life; breathe with gills; skeleton structure varies from primitive notochord forms to highly organized bony forms. Of many classifications, that below is one of the simplest.

Sub-cl. **Elasmobranchii** (Chondrichthyes): snout overhangs mouth; true jaws; skeleton cartilaginous; skin smooth with limy dots. Typical orders: Selachii, sharks (7-17), dogfish; Batoidi, skate and ray (7 58); torpedo-fish (7-294); sawfish (6-501).

Sub-cl. **Teleostomi** (Osteichthyes): Fishes with well-developed jaws and skulls; body skeleton varies from partly cartilaginous to well-developed bony type.

Ord. **Crossopterygii**: fins have bony axis, fringed with spines or rays. Numerous fossil types; two living African genera. These primitive fish, the "fringe-finned ganoids," are important because they are believed to belong to the ancestral stock of all the higher vertebrates.

Ord. **Dipneusti** (Dipnoi): lung-fishes (5-51): gristly skeleton; swim bladder has unusually rich lining of blood-vessels and serves as primitive lung when fish are out of water. Numerous in Palaeozoic times; few living types.

Ord. **Ganoidei**: the ganoids. Skeletons vary between primitive (cartilaginous) and advanced (bony) types; skin covered with bony plates, almost scale-like in some types. Typical sub-orders: Chondrostei, including sturgeon (7-174); Holosteii, including gar-pike and bowfin.

Ord. **Teleostei**: bony fishes; well-developed skeleton and scales; divided conveniently into following sub-orders:

1. **Malacopterygii** (Physostomi): fin-rays soft. Following principal families: Salmonidae, salmon (6 489), trout (7-319), char, smelt, grayling; Scombresidae, flying fish (4 304); Clupeidae, herring (4-171), sprat, sardine, etc.

2. **Apodes**: eels (3-170), pelican fish.

3. **Haplomi**: genus *Esox*, pike (6-200).

4. **Ostariophysi**: a very large and various group; families include Cyprinidae, carp (2-245), roach (6 403), dace (6-404), bream (2-54), goldfish (4-41), minnow, etc.; Blennidae, blennies, catfish (2-284); electric eel; suckers.

5. **Thoracostei**: includes sticklebacks (7-157); sea-horses (6-524).

6. **Anacanthini**: soft-finned types; fam. Gadidae, cod (2-442), haddock (4-115), pollack, etc.; fam. Pleuronectidae, in-

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eludes most of the flatfish, plaice, sole, halibut (4-119), turbot, flounder, etc.

7. **Acanthopterygii** : bony spines in fins. A very large group comprising many different forms. **Percidae**, perch (6-123), bass (1-380); sea bream; gurnards; dragonet (3-112); angler fish; angol fish. **Scombridae**, mackerel (5-64); tunny (7-328); swordfish (7-215); mullets; lumpsucker.

8. **Plectognathi** : highly specialised forms; sunfish (7-190).

Note : There is very little agreement between authorities on the classification of fishes. Some, for example, rank these sub-orders as orders; others place the flatfish in an order of their own; others, again, place the catfish group in the **Acanthopterygii**, and confine the **Ostariophysi** to the carp group. The classification given is intended to give an idea of the main relationships.

Class AMPHIBIA (BATRACHIA) (Amphibians).

The amphibians mark an intermediate stage between fishes and reptiles. As their name indicates (*amphi*, on both sides, *bios*, life), they are fitted for life in water and on land. The typical amphibians undergo metamorphosis; that is, they hatch from the eggs as gill-breathing larvae (tadpoles, for example) which then develop into lung-breathing adults. There are, however, exceptions to this rule. The fins of the fishes are in the amphibians replaced by legs; the skin is soft and glandular; heart is three-chambered. In former geologic periods amphibians were abundant but to-day there are few species.

Ord. Caudata or Urodela : tailed forms; types able to regenerate lost parts. Includes salamanders (6-488) and newts (5-407).

Ord. Eucadata or Anura : tail-less forms. Typical sub-orders: **Aglossa**, tongue degenerate, such as pipa toad; **Phaneroglossa**, tongue developed, including toads (7-286) and frogs (3-472).

Class REPTILIA (Reptiles).

The reptiles (6-388) have no larval stage; skeleton specialised for land life; four-chambered heart; aquatic forms breathe at surface; skin covered with scales or bony plates. The most primitive reptile stock (3-510) is believed to have evolved two great branches. The first, springing from **Theromorphodont** stock (see sub-class **Theromorpha** below) gave rise to the first mammals and various specialised reptiles of which the turtles are highest. The second branch came from stock of which the tuatara or *Sphenodon* is a living example, and gave rise to the first birds and specialised reptiles, of which the crocodiles, snakes, and lizards are the living forms. These two great groups are marked "Evolutionary Group A" and "Evolutionary Group B."

Evolutionary Group A.

Sub-cl. Theromorpha : varied extinct forms, with many skeletal details and teeth transitional between amphibia and mammals.

Sub-cl. Plesiosauria : plesiosaurs (6-282, 283 illus.). Extinct forms; long necks, paddle limbs; comparatively slow-moving, aquatic types.

Sub-cl. Ichthyosauria : ichthyosaurs (6-282, 283 illus., 1-159). Extinct forms; short necks, toothed beaks, swift-moving, whale-like forms, exclusively aquatic; bore living young.

Sub-cl. Chelonia :

Ord. Chelonia : tortoises and turtles (7-294; 6-388 illus.). Toothless, horny beak; body protected by bony case; limbs developed for walking or swimming. Divided into two sub-orders: (1) **Athecae**, shell leathery, including leathery turtles; (2) **Thecophora**, shell hard, including land tortoises and all the remaining turtles.

Note : The Order **Chelonia** of this classification is divided by some authorities into two Orders of which **Testudinata** contains tortoises and **Chelonida** turtles.

Evolutionary Group B.

Sub-cl. Prosauria : Typical sub-order is **Rhynchocephalia**, of which the tuatara or *Sphenodon* (4-530) is the only living representative. First birds may have developed from prosaurian stock.

Sub-cl. Pterosauria : Extinct flying reptiles, in wing development like bats. Typical order **Pterodactyli**, the pterodactyls (6-281), *Pteranodon* (6-281, 282 illus.).

Sub-cl. Dinosauria : Extinct; represented by several prehistoric monsters. Some had bird-like features (hollow bones, etc.), but birds already existed when these forms flourished.

Sub-cl. Crocodilia :

Ord. Crocodilia : differ from other reptiles chiefly in skull structure. Crocodiles (2-532; 4-173) and alligators (1-113, 157 illus.).

Sub-cl. Sauria : lizards and snakes. Differ from other reptiles chiefly in structure of skeleton.

Ord. Ophidia : snakes (7-74). Lack limbs; halves of lower jaw connected by elastic tissue. Anaconda (*f.i.*), boa constrictor (7-74, 75 illus.), python (6-315), cobra (2-436; 7-75 illus.), vipers (7-402), rattle snake (6-366), grass-snake (4-65).

Ord. Lacertilia : lizards (4-528); limbs usually developed and functional; halves of lower jaw fused solidly together. Divided into three sub-orders: (1) **Lacertae**, most typical lizards, including common lizards, iguanas (4-235; 3-413 illus.), Komodo dragons (3-112; 4-529), horned toad (4-530), Gila Monster (4-530, 528 illus.), flying lizard, slow worm (7-70; 4-529). (2) **Geckones**, the geckos (4-529; 3-413 illus.). (3) **Chameleontes**, chameleons (2-301; 3-333 illus.).

Note : Some authorities place snakes and lizards in Order **Squamata**, divided into Sub-orders **Ophidia** (snakes) and **Lacertilia** (lizards).

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Class AVES (Birds).

The skeleton of a bird resembles the reptile type, save in modifications for flying: the skin produces feathers (3 344); there is a four-chambered heart; teeth absent in living forms; all organs show adaptations for flying, evolved from reptile stock, after unsuccessful experiments such as *Pteranodon* (6 281, 282 illus.). Read first general articles on birds (1-453) and on eggs (3 172).

Sub-cl. **Archaeornithes**: extinct forms, possessed teeth; *Archaeopteryx* (6 282; 1-453 illus.).

Sub-cl. **Neornithes**: three super-orders: (1) **Odontognathae**, fossil forms such as *Hesperornis*. (2) **Palaeognathae** (Ratites), a heterogeneous group that have lost the "keel" to the breast bone and are flightless. Various orders, represented by *Struthio*, ostrich (6 8; 1-471 illus.; 3-413 illus.), three-toed, Old World; *Rhea* (7 97 illus.), three-toed, New World; *Casuariiformes*, casowary (1-312; 6 9), emu (3 242; 1-315 illus.), Australian; *Dinornis*, moa (*f.i.*), New Zealand; *Apteryx*, kiwi (1 186; 1-471 illus.), New Zealand; tinamous, S. America. (3) **Neognathae** (Carinatae): all the normal birds; breastbone has a keel for attachment of flying muscles.

Ord. **Spheriscornithes**: penguins (6 115, 117 illus. *f.*).

Ord. **Gaviiformes**: loon (*f.i.*), divers (*f.i.*).

Ord. **Colymbiformes**: grebes (4 69; 1-471 illus.).

Ord. **Tubinares** or **Procellariiformes**: albatross (1-92), shearwaters (7-20), petrels (6 146).

Ord. **Pelecaniformes**: pelican (6 108; 1-471 illus.), gannet (3 502), shag (7 11; 1-469 illus.), cormorant (2 506; 2 367 illus.), frigate-birds (3 471).

Ord. **Ciconiiformes**: Sub-ord. **Ardeae**, heron (4 170; 7-169 illus.), bittern (1 476), egret (7 168). Sub-ord. **Balaenicipites**, shoebill (7-166, 169 illus.). Sub-ord. **Ciconiae**, stork (7-166), ibis (7 168 with illus. *f.*), spoonbill (7-168, 169 illus.). Sub-ord. **Phoenicopter**, flamingo (3-385, 413 illus.).

Ord. **Anseriformes**: ducks (3-130), geese (4 46), swan (7 198).

Ord. **Falconiformes**: condor (2 479), vultures (7-407), adjutant bird (1-20), hawks and falcons (4-140), turkey buzzard (2 147), eagle (3-145; 1-157 illus.), secretary bird (6 528), buzzard (2 146), kite (4-415).

Ord. **Galliiformes**: game birds and poultry (6 277), grouse (4 99), partridge (6-93), peacock (6-100), pheasants (6-153), guinea-fowl (4-104; 1-66 illus. *f.*), turkey (7-332), quail (6-316).

Ord. **Gruiformes**: crane (7-168), rail (6-353), moorhen, coot, and corncrake (5 204 illus. *f.*).

Ord. **Charadriiformes**: waders (7-408), oyster-catcher (6-227; 1-468 illus.), plover (6-226; 1-471 illus.), snipe (7-75), woodcock (7-468), avocet (6-227), phalarope (1-470). Sub-ord. **Lari** includes gulls (4-105), terns (7-260), skua gulls (1-169).

Sub-ord. **Alci** includes auk (1-309), guillemot (1-309), razorbill (1 309), puffin (6-302).

Ord. **Columbiformes**: dodo (3-100), pigeons and doves (6 197).

Ord. **Cuculiformes**: cuckoo (3 7).

Ord. **Psittaciformes**: parrots (6 92), macaws (5-61), cockatoos (2-437); budgerigars (6-92).

Ord. **Strigiformes**: owls (6-11).

Ord. **Caprimulgiformes**: nightjars (5-438).

Ord. **Cypseliformes** or **Micropodiformes**: swift (7 198), humming-birds (4-203; 7-132 illus. *f.*).

Ord. **Coraciiformes**: kingfisher (4 404), hornbill (4 195).

Ord. **Piciformes**: toucan (7-301, 97 illus.), woodpeckers (7 468), wryneck (*f.i.*).

Ord. **Passeriformes**: the highest birds, including all the song birds. In general, adapted for perching; named from *passer*, sparrow in Latin. Below is set out a list of the most important of the families in the Ord. **Passeriformes**:

Menuridae: lyre-bird (5 55; 6-76 illus. *f.*).

Aludidae: larks (4 447).

Hirundinidae: swallows and martins (7 197).

Corvidae: crow (2-536), rook (6 449), raven (6 366), jay (4-357; 1-467 illus.), magpie (5 86; 1-467 illus.), jackdaw (4 333).

Ptilinorrhynchidae: bower-bird (2-28).

Paradisidae: birds of paradise (6-76, 77 illus. *f.*).

Paridae: tits (7-285).

Sittidae: nuthatch (5 486).

Certhiidae: tree-creeper (5-486).

Cinclidae: dipper (*f.i.*).

Troglodytidae: wren (7-500).

Turdidae: thrushes (7-271; 1-153 illus.), blackbird (1-477), robin (6-415), nightingale (5-436), wheatear (7-448), stone-and-whin-chats (7-448), orioles (6-4), hedge sparrow (7-123).

Sylviidae: warblers (7-418).

Regulidae: gold-crest (1-459 illus.).

Muscicapidae: flycatchers (3-402).

Motacillidae: wagtails (7-409), pipits (6 205).

Laniidae: shrikes (7-43).

Sturnidae: starling (7-151; 1-469 illus.).

Ploceidae: weaver-birds (*f.i.*).

Thraupidae: tanager (*f.i.*).

Fringillidae: finches (3-352), cardinal bird (*f.i.*), buntings (2-124), cross-bill (3-352), canary (2-207), linnet (4-515), sparrow (7-123), chaffinch (3-382).

Class MAMMALIA (Mammals).

The mammals (5-100) include all vertebrates which have true hair (4-417) and the young of which are nourished by their mother's milk. The class is here subdivided into three sub-classes according to the degree of development of the young at the time of birth. It is generally believed

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by scientists that mammals evolved from reptile or amphibian stock, although the course of evolution is uncertain. The earliest known mammals lived at about the same geological period as the giant reptiles and the first birds.

Sub-cl. Prototheria: primitive types; lay eggs and hatch young; one living order, *Monotremata*. Includes duckbill (3-133) and spiny ant-eaters (1-170; 3-133).

Sub-cl. Metatheria: young born alive but not perfectly formed; development completed in a skin-pouch on mother's body. One living order, *Marsupialia*, divided into two sub-orders: (1) *Diprotodonta*, teeth adapted to vegetable food: includes wombats, phalangers (5-137), kangaroo (4-391), koala (4-424; 1-315 illus.); (2) *Polyprotodonta*, teeth adapted to animal food: includes opossums (5-521), Tasmanian devil and Tasmanian wolf (7-229; 5-137), bandicoots (5-137).

Sub-cl. Eutheria (*Placentalia*): young completely developed when born; includes all other mammals.

Group Unguiculata.

Ord. *Insectivora*: The most primitive of the higher mammals; teeth suited for eating insects; feet plantigrade (sole-walking); most types nocturnal. Includes tree shrews (placed by some authorities in the *Primates*), elephant (or jumping) shrews, moles (5-231), shrews (*f.i.*), hedgehogs (4-152).

Ord. *Dermoptera*: flying lemurs; curious Malayan forms, with affinities to *Insectivora*, bats, and lemurs. Only two species are known.

Ord. *Chiroptera*: bats (1-380); fore-limbs winged; internal structure modified for true flight. Typical sub-orders: (1) *Megachiroptera*, teeth adapted to fruit-eating, flying foxes (1-382); (2) *Microchiroptera*, adapted to eating insects or sucking blood; includes vampire bats (1-382), and all the British bats.

Note: Many older authorities place the order *Primates* in a group separated from the other orders; they are here included with orders showing some affinities, following the grouping of G. G. Simpson (*f.i.*).

Ord. *Primates*: five-fingered hands and five-toed feet, with nails; eyes directed forward.

Sub-ord. *Prosimii* or *Lemuroidea*: lemurs (4-478). Face long and fox-like; tails not suited for grasping.

Sub-ord. *Anthropoidea*: face rounded, cranium comparatively high; internal organs more highly developed than in lemurs. Divisible into: (1) *Platyrrhina*, New World types, nostrils far apart, tail often prehensile, three pairs of premolar teeth in each jaw; (2) *Catarrhina*, Old World types, nostrils close together, tail never prehensile, two pairs of premolar teeth in each jaw. First two families are New World types, remainder Old World:

Fam. *Cebidae*: New World monkeys (5-240) with opposable thumbs, more or less naked ears, and flat or curved nails.

Fam. *Hapalidae*: marmosets (5-240 illus. *f.*). Thumbs not opposable, nails clawlike.

Fam. *Hylobatidae*: gibbons (4-18). long-armed, tailless; thumb short, backbone without S-shaped curve.

Fam. *Cercopithecidae*: Old World monkeys (5-240), including baboons (5-241), mandrill (5-242). Wedge-shaped chest; arms shorter than legs, tail usually present.

Fam. *Simiidae* or *Pongidae*: higher apes (1-179). Broad chest; arms longer than legs, but shorter than in gibbons; S-shaped curve of backbone partially developed; prominent canine teeth; jaws not curved at sides as in Man; cerebrum smaller than in Man. Includes orang-utan (5-526), chimpanzee (2-360), gorilla (4-48).

Fam. *Hominidae*: the human type. Single living genus, with one living species—*Homo sapiens*, Man (5-104).

Ord. *Edentata*: toothless or with rudimentary teeth in rear of jaw; exceedingly varied types. Two sub-orders: (1) *Pilosa*, hairy types, including sloths (7-68; 2-46 illus.), ant-eaters (1-170); (2) *Dasypoda*, armoured types, including armadillos (1-241).

Ord. *Pholidota*: true scaly ant-eaters or pangolins. Covered with horny, overlapping scales.

Group Glires.

Ord. *Rodentia*: rodents (*f.i.*); teeth and jaws adapted to gnawing. Single pair of incisors in upper jaw; families differ in skull structure and dentition. Includes squirrels (7-140), chipmunk (2-377), prairie dogs (*f.i.*), marmots (3-496), beavers (1-399), kangaroo rats, dormice (3-107), jerboas (4-361), hamsters (*f.i.*), vole (*f.i.*), lemmings (4-477), musk-rats (5-310), rats (6-365) and mice (5-288), porcupine (6-260), guinea-pig (4-105), capybara (*f.i.*), chinchilla (2-377).

Ord. *Lagomorpha* (by some authorities retained as Sub-order *Duplicidentata* of Order *Rodentia*). Two pairs of incisors in upper jaw. Includes hares (4-434) and rabbits (6-327), agouti (1-68).

Group Mutica or Cetacea.

Order *Cetacea* (mammals with flippers) (5-103).

Sub-ord. *Odontoceti*: toothed whales (7-445); includes sperm-whales, dolphins (3-105), porpoises (6-265), grampuses, and narwhals (*f.i.*).

Sub-ord. *Mystacoceti*: whalebone (or baleen) whales (1-164), right whales, rorquals (7-445, 446 illus.), humpback whales (7-446 illus.).

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Group Ferungulata.

Ord. Carnivora: flesh-eaters, though some forms are omnivorous and one or two entirely vegetarian. Teeth and skeletal structure adapted to seizing and killing prey. Divided into sub-orders according to internal structure.

Sub-ord. Fissipeda:

Fam. Canidae: dogs (3-100), dingo (1-312; 3-103), wolves (7-464), coyotes, jackal (4-333), fox (3-426). In all these there are special adaptations to running down prey; feet digitigrade.

Fam. Ursidae: bears (1-390); teeth adapted to partly vegetarian diet; feet plantigrade.

Fam. Procyonidae: raccoons (6-328); feet plantigrade, but usually arboreal creatures. The pandas (6-59) come between the raccoons and the bears. They are vegetarian and have plantigrade feet.

Fam. Mustelidae: weasel family, a highly successful group of very active, carnivorous forms, most of them small; feet partly digitigrade, body long and slender. Marten (5-137), stoat (6-296), weasel (7-433), polecat (*f.i.*) and ferret (3-348), mink (5-221), wolverine, skunk (7-64), badger (1-345), otter (6-10; 4-209).

Super-Fam. Feloidea:

Fam. Viverridae: civets, etc., with the Sub-fam. *Herpestinae*: mongooses (5-239).

Fam. Hyenidae: hyenas (4-222).

Fam. Felidae: cats (2-261). Very highly specialised for predatory habit. Domestic cats, jaguar (4-336), leopard or panther (4-484), lion (4-520, 1-61 illus.), ocelot (4-484; 2-263), puma (6-304; 5-455 illus.), tiger (7-276), lynx (5-54), cheetah (1-60 illus.).

Sub-order Pinnipedia:

The Pinnipede series contains three families: *Otariidae*, in which are the sea-lions and fur-seals (6-525); *Odobenidae*, containing the walrus (7-417); and *Phocidae*, the true seals (6-528), sea-elephants (6-536).

Ord. Tubulidentata: aardvarks (1-2). Tubular snout, large number of lumbar vertebrae.

Note: The following Orders have by some authorities been grouped together broadly as *Ungulata*.

Ord. Proboscidea: nose and upper lip extended to form trunk. Elephants (3-225), mammoths and mastodons (5-103).

Ord. Hyracoidea: some unique skull features; cheek teeth like those of rhinoceros; in size and habits like hares. Hyrax or rock-rabbit (5-100 illus.).

Ord. Sirenia: aquatic mammals with flippers; eat vegetable food, in contrast with *Cetaceans* (*see* Group *Mutica* or *Cetacea*)

and the seals (*see* Ord. *Carnivora*); internal structure indicates descent from ancestor of *Proboscideans*. Includes sea-cows (5-396), manatees (*f.i.*), and dugongs.

Ord. Perissodactyla: hoofed animals, usually odd-toed; where toes are even in number, they are not symmetrical about the vertical plane of the hoof.

Fam. Equidae: foot structure highly evolved, teeth unusually long. Includes horse (4-196), ass (1-275), zebra (7-522).

Fam. Tapiridae: tapirs (7-227); have proboscis, small tusks, and simple teeth; front foot has four toes.

Fam. Rhinocerotidae: rhinoceroses (6-392).

Ord. Artiodactyla: hoofed animals, usually even-toed; odd-toed types have digits symmetrical about the vertical plane of the hoof.

Sub-ord. Suina: lower leg not fused into cannon bone; upper incisor teeth always present, often tusked. Stomach varies from simple to ruminant type.

Fam. Suidae: pigs (6-196), wild boar (1-496), wart-hog (7-420). Snout has fleshy button, tusks of male curve upwards; stomach simple; four toes on each foot, outside two off ground.

Fam. Tayassuidae: peccaries (*f.i.*). Tusks small, point downward; front feet have four toes (two not touching ground) and rear feet only three.

Fam. Hippopotamidae: hippopotamus (4-179). Muzzle broad, rounded; stomach complex; all four toes touch ground.

Sub-ord. Tylopoda: feet have large, cushioned pads; stomach complex but not completely ruminant. Typical family. *Camelidae*, camels (2-183), alpaca (1-119), llama (4-530).

Sub-ord. Pecora: true ruminants ("cud-chewers").

Fam. Giraffidae: giraffes (4-21). Adapted to browsing; solid-horned. Also the okapi (*f.i.*).

Fam. Cervidae: deer (3-59; 5-433 illus.); antlers solid-horned, shed annually. Caribou (2-242), moose (5-260), musk deer (5-309), reindeer (6-379), wapiti (3-60; 5-455 illus.).

Fam. Antilocapridae: American antelope or pronghorns; hollow horns growing from bony cores and shed annually.

Fam. Bovidae: includes cattle (2-273), buffalo (2-109), yak (7-511), sheep (7-20), goats (4-37), ibex (4-227, 37), bison (1-475), aurochs, musk ox (5-309), true antelopes (1-170), chamois (2-301), Rocky Mountain goat (1-171), gazelles (1-171, 60 illus. *f.*); permanent hollow horns growing from bony horn-core.

BOOKS TO STUDY

IN connexion with our Study Outlines we give here a classified selection of books on the various subjects, recommended to those who wish to take their studies further. The books, which are obtainable from any good public library, are mostly selected with an eye to the requirements of younger readers, from about eleven years old and upwards, and the selection is closely based on the recommendations of the Library Association.

AGRICULTURE

- In Search of Food.** D. Clark
The Seasons and the Farmer. F. F. Darling
A History of Agriculture. T. B. Franklin
Round the Year on the Farm. A. G. Street
The Principles of Agriculture. J. R. Ainsworth Davies
The Soil. Sir A. D. Hall

ARCHITECTURE

Sir Banister Fletcher's *History of Architecture* is a standard work that can be consulted at any time with profit and pleasure. A good shorter history is *Architecture* by W. R. Lethaby. The following are recommended for younger students:

- Architecture for Children.** Jane and Maxwell Fry
How to Look at Old Churches. H. S. Stowell
Exploring Old Buildings. E. V. Clark
A Little Book of Architecture. N. Jewson
The Observer's Book of British Architecture. J. Penoyre and M. Ryan
Other People's Houses. R. K. and M. I. R. Polkinghorne

ASTRONOMY

- A Guide to the Sky.** E. A. Beet
Our Wonderful Universe. C. A. Chant
The Spangled Heavens. L. Edwards
Observing the Heavens. P. Hood
The Mysterious Universe. Sir James Jeans

BIOLOGY

A Child's Biology, by Brian Vesey Fitzgerald, is recommended as a single approach to the subject, as is *The Young Naturalists Discover Spring*, by A. F. C. Hillstead. A comprehensive scientific but simply told account of evolution, from the time of the earth's formation to the New Stone Age, is *When the World was Young*, by M. McB. Morrell.

The following books present a few technical difficulties to the newcomer in Biology, but to the enthusiastic student they may well prove as fascinating as any story of travel and adventure. See also lists under **BOTANY** and **ZOOLOGY**.

- Elements of Plant Biology.** A. G. Tansley
Essays of a Biologist. J. S. Huxley
Life—Outlines of General Biology. Sir J. A. Thomson and Sir P. Geddes
The Origin of Species. Charles Darwin
Mendel's Principles of Heredity. William Bateson
Man's Place in Nature. T. H. Huxley
The Origin and Evolution of Life. H. F. Osborn
The Science of Life (2 vols.). H. G. Wells, J. S. Huxley, and G. P. Wells
Biology for Everyman, ed. Sir J. A. Thomson
Animal Ecology C. E. Elton
Animal Biology. Grove and Newell

BOTANY

A number of good books on British wild flowers are listed under **NATURE STUDY** and others of general interest to the Botany student will be found under **BIOLOGY**. The following are further useful books on various aspects of Botany:

- Botany for Fun.** G. H. Browning
Practical Plant Ecology. A. G. Tansley
A Pocket Book of British Trees. E. H. B. Boulton
A Book on Common Flowers. R. Bracher
Hayward's Botanist's Pocket Book
The Romance of the Fungus World. R. T. and W. Rolfe

CHEMISTRY

- Reference Book of Inorganic Chemistry.** W. M. Latimer and J. M. Hildebrand
Outlines of Organic Chemistry. E. J. Holmyard
Everyday Chemistry. J. R. Partington
Fun with Chemistry. M. and I. Freeman
Chemistry Experiments at Home. H. L. Heys
The Young Chemist. F. Sherwood Taylor

GEOGRAPHY

- Man the World Over.** G. C. Carter and H. C. Brontnall
World Wealth in Maps. S. Harrop
Story Atlas. J. Sterling
The Lands of the Commonwealth. R. K. and M. I. R. Polkinghorne
Famous Voyages of the Great Discoverers. E. Wood
A Study of the Oceans J. Johnstone

Also recommended are the various volumes in the *Young Traveller* series, which includes books on Ireland, Canada, Australia, India and Pakistan, Switzerland, the Netherlands, the U.S.A., China, etc.

HISTORY

There are, of course, countless works on History. The student is advised to read some general survey of world history such as *The Outline of History* or *A Short History of the World*, both by H. G. Wells, or the *Universal History of the World* (8 vols.), edited by Sir John Hammerton. A masterly short account is *The Living Past*, by F. S. Marvin. Younger readers will probably prefer I. O. Evans's *Junior Outline of History*, which is well recommended.

ANCIENT

- When the World was Young.** M. McB. Morrell
The Dawn of European Civilization. V. Gordon Childe
Digging Up the Past. Sir C. L. Woolley
History of the Ancient Egyptians. J. H. Breasted
Babylonian Life and History. Sir E. Wallis Budge
The Story of Greece. M. MacGregor
The Story of Rome. M. MacGregor

BOOKS TO STUDY

Everyday Life in the Old Stone Age, also New Stone, Bronze, and Early Iron Ages. M. and C. H. B. Quennell

Everyday Things in Homeric Greece, also Classical Greece. M. and C. H. B. Quennell

Classics that can always be consulted with profit include Plutarch's Lives, Herodotus' History, and Gibbon's Decline and Fall of the Roman Empire; while the Cambridge Ancient History is a standard work of reference and scholarship.

MEDIEVAL

In Feudal Times. E. M. Tappan

The Story of the Crusades. E. M. Wilmot-Buxton

The Holy Roman Empire. James Brice

Medieval Europe. H. W. C. Davis

Stories from Froissart. Ed. Sir H. Newbolt

Medieval People. Eileen Power

A standard work of reference and scholarship is the Cambridge Medieval History, ed. H. M. Gwatkin.

MODERN

History of Europe. H. A. L. Fisher

Cambridge Modern History

BRITISH HISTORY

History of England. G. M. Trevelyan

English Social History. G. M. Trevelyan

Oxford Manuals of English History Ed. Sir C. W. C. Oman

The Homeland Histories (6 separate vols.) W. J. Claxton

Our Island Story. H. E. Marshall

Scotland's Story. H. E. Marshall

The Story of England. Sir Arthur Bryant

A Modern History of the English People (1880-1922). R. H. Gretton

England 1870-1914. P. C. K. Ensor

Everyday Life in Roman Britain. M. and C. H. B. Quennell

A History of Everyday Things in England (4 vols.) M. and C. H. B. Quennell

HOUSEHOLD SCIENCE

A good standard reference book forming a complete guide to the art of running a home is The Concise Household Encyclopedia. The following books are recommended as specially suitable for younger readers.

Judy's Book of Housework. M. Goaman

Judy's Book of Sewing and Knitting. M. Goaman

Judy's Cookery Book. M. Goaman

Cookery for Girls. M. G. Laskie

Needlework for Girls. I. Horner

INDUSTRIES AND APPLIED SCIENCES

Water Supply To-day. J. Bowman

Spanning Space (a book about bridges). C. A. Claremont

The Story of Power. G. Gerard

Great Engines and their Inventors. G. S. Ranshaw

The Boy Electrician. J. W. Sims

How Radar Works. K. Ullyet

Railways for All. Ed. H. C. Webster

Rockets and Jets. Ed. R. B. Wav and N. D. Green

Flight To-day. J. L. Naylor and E. Ower

Modern Motor-cars. C. Grant

Man is a Weaver. E. C. Baity

Silk: its Production and Manufacture. L. Hooper

Timber: From the Forest to its Use in Commerce. W. Bullock

History and Development of Road Transport. J. Patterson

Books in the Commodity series include The Story of Oil, also of Steel, Plastics, Cotton, Wool, Rayon, Coal, and Rubber.

LITERATURE

Reference Book: The Cambridge History of English Literature

English Literature for Boys and Girls. H. E. Marshall

Enjoying Books. G. Trease

Poetry for You. C. Day Lewis

The Golden Road in English Literature. Amy Cruse

Short History of French Literature. G. A. Saintsbury

The Literature of Germany. J. G. Robertson

History of Italian Literature. Richard Garnett

History of Spanish Literature. J. Fitzmaurice-Kelly

An Outline of Russian Literature. Maurice Baring

History of Ancient Greek Literature. Gilbert Murray

Latin Literature. J. W. Mackail

In addition the vast field of literature itself should be studied, for the best of all ways of learning about great books is to read them. The student should make his own selection from such series as Everyman's Library or The World's Classics. Famous anthologies of English poetry include The Oxford Book of English Verse, Palgrave's Golden Treasury, and the "collection of rhymes and poems for the young of all ages" made by Walter De la Mare, entitled Come Hither. Modern Verse for Young People, ed. M. Williams, is a useful introduction to modern poetry. The English Men of Letters series provides excellent short biographies of all the greatest English writers.

MUSIC

The standard work of reference is Grove's Dictionary of Music and Musicians, available at most good reference libraries; but a valuable reference work for the home is The Oxford Companion to Music, ed. by P. A. Scholes.

Listening to the Orchestra. K. Barne

The Instruments of Music. R. Donington

Going to a Concert. L. Salter

The First, Second, and Third Books of the Great Musicians (3 separate vols.) P. A. Scholes

Music is for You. P. M. Young

MYTHOLOGY

The Heroes. Charles Kingsley

The Wonder Book. Nathaniel Hawthorne

Tanglewood Tales. Nathaniel Hawthorne

Legends of Greece and Rome. G. H. Cupper

The Iliad, trans. by E. V. Rieu

The Odyssey, trans. by E. V. Rieu

The Children's Iliad. A. J. Church

The Children's Aeneid. A. J. Church

Asgard and the Norse Heroes. K. F. Boulton

Told by the Northmen. E. M. Wilmot Buxton

The Fall of the Nibelungs. M. Armour

NATURE STUDY

Outline of Nature in the British Isles, ed. Sir John Hammerton, is a comprehensive work in 3 volumes with hundreds of excellent photographs. There are also various helpful series well worth collecting for your bookshelf in separate volumes. Examples are the Wayside and Woodland series, consisting of books on Birds, Animals, Butterflies and Moths, Spiders, Bees and Wasps, Fishes, Ferns, Trees, and Flowers.

BOOKS TO STUDY

Nature study books in the popular Observer's pocket series include handy books on British Birds; Wild Animals; Fresh-water Fishes; Grasses, Sedges, and Rushes; etc. The Shown to the Children series, suitable for very young students, includes volumes on Birds, Flowers, Butterflies and Moths, Bees, the Seashore, etc.

The following are recommended individual works :

The Young Naturalist. Sir J. Buchan-Hepburn
The Book of the Countryside. F. M. and T. Duncan
The Open Book of Wild Life. R. Morse
Nature Rambles (4 separate vols., Spring, Summer, Autumn, Winter). E. Step
Trees and Shrubs of the British Isles. N. B. Hodgson
Wild Flowers at a Glance. M. C. Carey and D. Fitchew
Neptune's Garden. L. R. Brightwell
Life on the Seashore. E. A. R. Ennion
Shell Life. E. Step
The Fishes of the British Isles. J. T. Jenkin
The Naturalist on the Seashore. E. M. Stephenson
The Pond People. L. R. Brightwell
Aquariums. A. Evans
Insects of the British Isles. N. B. Hodgson
The Pocket Guide to British Birds. R. S. R. Fitter and R. A. Richardson

And you might also like to possess two "classics" of the subject, The Natural History of Selborne, by Gilbert White, and The Charm of Birds, by Viscount Grey of Falloden.

PAINTING

Bryan's Dictionary of Painters and Engravers
The Story of Painting. Agnes Allen
The Paintbox. Martin Armstrong
Famous Paintings. A. E. Chase
Enjoying Painting. A. C. Ward
The Outline of Art. Ed. by Sir W. Orpen

PHYSICS

Physics for Everyone. E. F. Carter
Romp through Physics. O. W. Gail
Fun with Mechanics. H. McKay
The Tricks of Light and Colour. H. McKay
Conquest of the Atom. R. D. Potter
Atomic Power. R. Barnard Way
Matter, Energy, and Radiation. J. R. Dunning and H. C. Paxton
Text-Book of Physics. J. Duncan and S. G. Starling

PHYSIOLOGY

Human Growth. L. F. Beck and M. Robinson
An Active Human Biology. C. Bibby
The Food We Eat. B. and M. Holmes
How You Work. I. Wilson

SOCIAL SCIENCES

SOCIOLOGY

This list is necessarily restricted to a few standard works on the whole subject. A library catalogue will provide students with the titles of many books on the hundreds of different minor aspects of Sociology.

Principles of Sociology. L. T. Hobhouse
The Social Contract. Rousseau
Sociology : the Psychology of Society. M. Ginsburg
Social Psychology. K. Young
A Study of History. A. I. Toynbee
Plato's Republic
More's Utopia

ECONOMICS

Your Work and Wages. C. Furth and S. Graves
The Money Book. A. Groom
Everyday Economics. R. R. Martin
"Classics" of the subject, with which the serious student should quickly make some acquaintance, include the following :
The Wealth of Nations. Adam Smith
Principles of Political Economy and Taxation. D. Ricardo
Principles of Political Economy. J. S. Mill
Capital. Karl Marx

CIVICS

The Story of Our Parliament. A. Allen
You and the State. C. Furth
Young Citizens : Simple Civics for Boys and Girls. K. Gibberd

ZOOLOGY

Mammals in Britain. M. Blackmore
Animals of the British Isles. H. Cory
The Animal's World. D. L. Mackinnon
World Natural History. E. G. Boulenger
How Birds Live. E. M. Nicholson
The Invertebrata. Borradaile and Potts

Interest-Questions on Many Subjects

What supports an aeroplane in the air ? 1-38.
Why is the sky blue ? 1-81.
Who was the first man to go up in a balloon ? 1-354
What makes the water spurt up in an artesian well ? 1-255
What part of your weight is blood ? 1-489.
Why did the Ancient Egyptians put straw in their bricks ? 2-57
Does a compass needle point exactly north ? 2-475.
Where is most of the world's amber obtained ? 1-131.
Why is the outer rail of a railway track raised higher than the inner rail at a curve ? 2-203
How do feathers grow ? 3-314.
How does the earthworm help the farmer ? 3-153
Why does a dog turn round before lying down ? 3-100.
Why must a deep-sea diver come up slowly ? 3-05.
Why does dew not form on cloudy nights ? 3-82.
Why does cork float ? 2-505.
What was the first metal worked by Man ? 2-502.
What metal was named after a mischievous goblin ? 2-434.
Why does phosphorus shine in the dark ? 6-162.

What gas was discovered on the sun before it was found on the earth ? 4-160
Why does a stick look bent in water ? 4-498.
How did "pig iron" get its name ? 4-293
What gives fireworks their colours ? 3-360.
What people used baskets for carrying water ? 1-384.
Why does a piece of iron get hot when it is hammered ? 4-146
Why must safety matches be struck on the box ? 5-149.
Why, if mercury is a liquid, will it not wet paper ? 5-173.
What plants eat animals ? 6-217 plate f.
If you plant a seed upside down, will the root grow upward instead of downward ? 6-217
How many earthworms are there in an average acre of soil ? 3-151
What animals have four stomachs ? 2-273
How does a potter "throw" a vase ? 6-274.
What animal has a hide over an inch thick ? 4-179.
From what fish are caviare and kinsglass obtained ? 7-174.
How fast can a homing pigeon fly ? 6-198.
How far can a rattlesnake reach when it strikes ? 6-366.
Where do crabs climb trees ? 2-524.

Easy Reference

FACT-INDEX

**A Guide to the Contents of
Volumes 1-7 with Thousands
of Additional Facts and Figures**

How to Use the Fact-Index

THE Editor has stressed in the opening pages of each of the seven earlier volumes that whenever your immediate object in using **THE BOOK OF KNOWLEDGE** is to acquire a particular item of information, you should first refer to this **FACT-INDEX**. If the information is recorded anywhere within the first seven volumes, the **FACT-INDEX** will tell you where to find it; or it may directly yield the information you require—for a very large proportion of its entries give briefly the essential facts about a subject.

In indicating to you where to find information elsewhere in **THE BOOK OF KNOWLEDGE**, the number of the volume is given first in **black-face** type, followed by the page number in that particular volume. Thus the reference **5 320** would mean that you should look in Volume 5 and turn to page 320. When the **FACT-INDEX** refers you to the main article on a given subject, the page number is also given in **black-face** type, thus: **7 245**—meaning that the chief information about the subject in question will be found on page 245 of Volume 7. But further information elsewhere may also be indicated in the usual way. The latest census figures for populations of cities, towns, etc., are given, and in some cases these may be found to differ from earlier figures given in the first seven volumes.

Key to Pronunciation

Most of the subject-headings in **THE BOOK OF KNOWLEDGE** require no special indication in the way in which they should be pronounced. There are also many for whose proper pronunciation it is only necessary to know which syllable is stressed; in these cases the stress is shown *after* the syllable, thus, *A'jax*. The pronunciations given are those preferred by the most recent authorities. For foreign names the native pronunciation is given except where the English pronunciation is well established. Where further guidance is necessary, the following signs are employed:

ah a as in father
aw a as in ball
o vowel sound in fern, word, girl, curl
ow vowel sound in now, bout
oi vowel sound in noise, boy
Unmarked vowels have their **short sound**, as a in hat, e in bet, i in bit, o in not, u in but, oo in book
Marked vowels have their **long sound**, as in hāte, bē, bite, note, tūne, boom


Vowels in Italics have a slurred or obscure sound as in abet (*abet*), recent (*re'sent*), conform (*konform*), nation (*na'shun*), tailor (*ta'lor*)
th first sound in thing, thank
th first sound in the, that
zh s in measure, leisure
g hard g, as in good, girl
i soft g, as in gem, ginger
kh guttural in loch





Abbreviations Used in the Fact-Index

Abbreviations most commonly used in this work are listed below; those abbreviations also often met with in conversation or reading are given separately; in the *Fact-Index* lists of *counties* under **ENGLAND**, **N. IRELAND**, **SCOTLAND** and **WALES**, and *states* under **UNITED STATES OF AMERICA** give abbreviations where appropriate

a., area	Fr., France, French	parl., parliament, parliamentary
agric., agriculture	frontis., frontispiece	pop., population
Amer., American, America	Ger., Germany, German	Port., Portugal, Portuguese
anc., ancient	Gk., Greek	pres., president
b., born	govt., government	Prot., Protestant
biol., biology, -ist	Gr., Great	prov., province
bor., borough	hist., history	r., river
bot., botany, -ist	h.q., headquarters	rep., republic
Brit., Britain, British	incl., including, included	rev., revolution
c., circa	illus., illustration	riv., river
Can., Canada, Canadian	Ire., Ireland	rly., railway
cap., capital	isl., island	R.C., Roman Catholic
cath., cathedral	It., Italy, Italian	Rom., Roman
Cath., Catholic	L., Lake	Russ., Russia, Russian
cent., central, century	lit., literature, literally	Scot., Scotland, Scottish
ch., church	m., miles	sec., secretary, seconds
Chem., chemical, chemistry	marit., maritime	Sp., Spain, Spanish
co., county	Mex., Mexico, Mexican	spt., seaport
d., died	mfg., manufacturing	sq. m., square miles
dept., department	mfrs., manufactures	stn., station
diag., diagram	min., minutes, minister, ministry	tn., town
dist., district	mkt., market	U.K., United Kingdom
Eg., Egypt, Egyptian	mt., mountain	univ., university
emp., empire, emperor	mus., music, musical	U.S.A., United States of America
Eng., England, English	myth., mythology	U.S.S.R., Union of Soviet Socialist
esp., especially	N. Ire., Northern Ireland	Republics
est., estimated	nr., near	Vol., Volume
establ., established	N.S.W., New South Wales	yrs., years
f., facing (of plates)	N.Z., New Zealand	zool., zoology



MANY of our letters derive from picture-writings of animals, birds, and parts of the body. The birds, indeed, gave us a large number of letters. The owl, for example, with its horns and its beak, gave us our M. The letter Z was originally a duck of ancient Egypt, while the eagle grew into our A. In Egyptian picture-writing the eagle first had its proper shape like this: . Then as it came to be made by the Egyptian

scribe in writing a running hand, it was simplified to this: . When the letter in this second form passed over into the Phœnician alphabet and was used in stone inscriptions, it was found easier to carve by using straight strokes of the chisel, and it was made like this: . It was left to the Greeks to adopt this form for their letter *alpha*,  gradually straightening it until in its classic form  it was little different from our own letter.

A1. Shipping term, 1-1; at Lloyd's, 4-533.

Aachen (ah'khen). Tn. in Ger., 45 m. by rly. w. of Cologne; pop., 110,000, 1-1; woollen industry, 4-5.

Aalborg (awl'borg) ('Eel-town'), Denmark, port of Jutland; pop. 60,880; exports fish, grain; important commercially from medieval times, 3-72.

Aar (ahr). Largest r. (180 m.) entirely within Switzerland; rises in Aar Glacier and flows s.w., falling into Rhine opposite Waldshut.

Aardvark. An ant-eating mammal, 1-2. **Aardwolf** (ard'wolf) ('earth wolf'), a hyena-like mammal of Africa; food chiefly termites and carrion.

Aarhus (ahr'hoos). Second largest city of Denmark; pop., 67,500; trade in grain, cattle; shipyards, iron-foundries; seat of bishop since 10th cent.; fine 13th cent. cath.; 3-72.

Aaron (a'on). First high priest of Israelites, brother of Moses; spokes-man for Moses before Pharaoh; with Moses led Israelite exodus from Egypt; made idol Golden Calf while Moses was on Mt. Sinai.

Aaron's Rod. Various tall flowering plants (golden-rod, mullein, etc.) named after budding and flowering of Aaron's rod (Num. xviii); in architecture, ornamental rod with leaves or entwined serpent.

A.B. See **Nautical Terms** (table).

Aba (ah'a), a sleeveless outer garment, usually of camel's or goat's hair, frequently of striped pattern, worn by Arabs.

Abaca (ah'aka), a plant (*Musa textilis*), source of Manila hemp.

Aback. See **Nautical Terms** (table).

Abacus. Framework with movable beads for counting, 2-167; and arithmetic, 1-237, with illus.

Abacus. In architecture, the slab which forms the top of a capital.

Abadan, Persia. Isl. in the delta of Shatt-el-Arab; pop. 201,000; large oil refineries operated since 1934 by the Persian govt. and the International Oil Consortium, 6-134.

Abast. See **Nautical Terms** (table).

Abalone (ah-ba-lone) or **Haliotis**. Edible shellfish. A genus of gastropod molluscs, order Archaeogastropoda.

Abana (ah'ah-nah) or **Amanah** (now **Farada**) and **Pharpar** (now **Awaj**). Two famous "rivers of Damascus," mentioned in Bible (2 Kings r. 12).

Abancay. Tn. of Peru, cap. of Apurimac dept., in centre of a fertile basin. Produces sugar cane, lucerne, coffee, fruits. Pop. 5,000.

Abattoir. A slaughter-house, specially equipped for the killing of animals for food. Govt. controlled in U.K.

Abbas (the Great). Shah of Persia (1586-1628); able military administrator, but cruel and capricious, 6-132.

Abbas II. Hilmi (1874-1941). Third and last Khedive of Egypt; ruled under Brit. supervision until deposed (1914) for plotting with Turks.

Abbasides (Abas'idz). Second great dynasty of Mohammedan caliphs; ruled at Baghdad 750-1258; based claim on descent from Abbas, uncle

of Mahomet; most famous sovereign Harun al-Raschid.

Abbe, Ernst (1810-1905). Ger. scientist, from 1888 owner of Zeiss optical works; invented Abbe refractometer; improvement to microscope, 5-193.

Abbess. Head of a convent; now called the Mother Superior, 5-215.

Abbeville (ah-bé) France. Picturesque town on Somme, 12 m. from the English Channel; pop. 20,373; mfrs. cloth, carpets, hemp goods, sugar; has shipbuilding yards, trades in grain.

Abbey. Religious house, 1-2.

Abbey Craig, Scot., Wallace memorial at 7-115 illus.

Abbey Theatre. Dublin; and the Irish drama, 4-287, 3-130.

Abbot. Head of a monastery, 5-244.

Abbotsbury, Village of Dorset, Eng.; swannery, 7-200, 6-265.

Abbotsford. Home of Sir Walter Scott, built 1811-24 on right bank of r. Tweed, near Melrose Abbey Roxburghshire, Scot. Part is now a museum housing robes of the novelist, 6-517.

Abbreviations in writing, 1-3. See also **List of Abbreviations** in 8-206-211. See also **forcing pump**.

Abd-el-Kader (ah-bel-kah'dar). (c. 1807-83). Arab chief; struggled for 15 yrs. against Fr. conquest of Algeria; surrendered in 1847.

Abdication, renunciation of an office, usually by a ruler. In Britain a king cannot abdicate without the consent of Parliament; in absolute monarchies he may abdicate when he pleases. Among rulers who have abdicated are Diocletian, Roman Emperor (305), Romulus Augustulus, Roman Emperor (476), Richard II of England (1399), Charles V. Holy Roman Emperor (1556), Mary Stuart of Scotland (1567), James II of Scotland (1688), Napoleon I of France (1814 and 1815), Pedro II of Brazil (1889), Manuel II of Portugal (1910), Pu-Yi (Hsuan Tung) of China (1911), Nicholas II of Russia (1917), Ferdinand I of Bulgaria (1918), William II of Germany (1918), Charles I of Austria-Hungary (1918), Mohammed VI of Turkey (1922), Edward VIII of England (1936), Carol of Rumania (1940), Victor Emmanuel III of Italy and his son Humbert (1946), M. 'a-el of Iran (1947), Farouk of Egypt (1952).

Abdomen (ah-bd'men or ah-dō-men), in the human body, the lower cavity containing liver, pancreas, spleen, kidneys, stomach, intestines, etc.

Abdominal surgery, 7-195.

Abdul-Hamid (ah-ham'd) II (1842-1918). Sultan of Turkey; succeeded in 1876; encouraged massacres of Christian subjects; ruled by terror and spy system; deposed in 1909 7-325.

Abdul'lah Ibn Hussein (1882-1951), second son of Hussein Ibn Ali, recognized as Amir of Transjordan in 1921; assumed title of king, 1916. Assassinated in 1951. Rule in Jordan, 4-382.

Abdul-Mejid (1823-61). Sultan of Turkey; succeeded in 1839; kindly

but weak would-be reformer; France and England fought Crimean War on his behalf.

A Becket. See **Becket**.

A'bel. Younger son of Adam and Eve; killed by Cain, his brother (Gen. iv).

Abel, Sir Frederick Augustus (1827-1902). Eng. chemist; noted authority on explosives, part inventor with Sir James Dewar of cordite; gave name to Abel Test (of flash-point) of petroleum.

Abel, John Jacob (1857-1938). American chemist; professor of pharmacology, Johns Hopkins University after 1893; discovered method of forming cry-talline insulin.

Abel, Robert (1859-1936). Eng. professional cricketer, played for Surrey 1881-1901. Highest score, 357 not out v. Somerset, May 1899. Totalled 3,309 runs, 1901.

Ab lard, Pierre (1079-1142). Fr. medieval scholar, 1-3; as philosopher, 6-160.

Abel test. Determining the flash-point of a volatile oil by heating it in a closed cup and passing a small flame over its surface at regular intervals of temperature. The apparatus was invented by Sir Frederick Abel.

Abenorrages. Powerful Moorish family which settled in Spain in 8th cent.; massacre legend, 1-111.

Abokuta. Tn. in Nigeria, W. Africa, pop. 81,000 5-435.

Aberbrothock. Old name of Scottish tn. Abroath.

Aberconway (Abernarnonshire). See **Conway**.

Abercorn, James Edward Hamilton, 3rd Duke of (1869-1951). First Gov. of Northern Ireland (1922-45).

Abercrombie, Lascelles (1881-1938). Eng. writer, poet and critic; Prof. of English at Leeds Univ., later at Bedford Coll., London, 3-291.

Abercrombie, Sir (Leslie) Patrick (b. 1879). Brit. architect; prof. of Town Planning, London Univ., 1935-46; planned reconstruction of London, Edinburgh, Plymouth, etc.

Abercromby, Sir Ralph (1734-1801). Brit. soldier, fatally wounded at his great victory at Alexandria over Napoleon's army in Egypt; and Cleopatra's needle, 2-408.

Aberdare (ah-bardar'), Wales. Coal-mining and market town in Glam.; brick works, breweries; pop. 10,916.

Aberdare Mts., Kenya. Highest peak Mt. Kenia, 12,772 ft., 4-400 illus.

Aberdeen, George Hamilton Gordon, 4th Earl of (1784-1860). Brit. statesman; Prime Minister, 1852-55.

Aberdeen. City of Scot., co. tn. of Aberdeenshire, and chief spt. of N. Scot.; pop. 182,714, 1-4.

Aberdeen Angus, breed of cattle, 2-271, 275 illus.

Aberdeenshire. Co. of Scot.; area 1,970 sq. m.; pop. 308,055, 1-5.

Aberdovey. Tn. in Merionethshire, Wales, 5-175.

Aberfeldy. Holiday resort in Perthshire, Scot.; pop. 1,523, 6-138.

Abergavenny. Market tn. in Monmouthshire; pop. 8,844, 5-246.

Aberglaslyn, Pass of. Beauty spot in N. Wales. The r. Glaslyn flows between rocky walls, rising to 700 ft.

ABERNETHY

Abernethy, John (1764-1831), English surgeon, famous for his lectures at Bart's, for his eccentric rudeness to private patients, and for his book *The Constitutional Origin and Treatment of Local Diseases*.

Aberration. In optics, the various ways in which a single lens fails to produce a sharp and accurate image of the object; in lenses, 4-482; in microscope, 5-195.

Aberystwyth. Tn. in Monmouthshire, Eng.; pop. 12,350; coal-mining centre, 5-245.

Abertillery [ab'rti'l'ri]. Tn. in Monmouthshire, Eng.; pop. 27,617; coal-mining centre, 5-245.

Aberystwyth [aberist'wlth], Wales. Seaport tn. of Cardiganshire; pop. 9,323; National Library of Wales; university college; seaside resort; as cultural centre, 2-220.

"Abide with me." Hymn, 4-226.

Abidjan. Tn. and admin. centre of Fr. Ivory Coast, W. Africa; pop. 46,000. 7-440.

Abies (Bot. genus). See Fir.
Abietic Acid, main constituent of rosin.
Abigail [ab'ig'ail]. Wife of Nabal; ministered to the fleeing David, who married her on Nabal's death (1 Sam. xxv, 14-42); name used to mean a waiting-maid.

Abimelech [abim'e'lek]. A judge of Israel who set himself up as king and reigned for three years in Shechem. During an uprising against him he was struck on the head by a piece of millstone thrown by a woman, whereupon at his own order he was slain by his armour-bearer (Judges viii, ix).

Abingdon. Market tn., Berks, Eng., on Thames, 6 m. s. of Oxford. Grammar school founded 1563. Pop. 10,176.

Abitibi. Riv. and lake in Ontario, Canada. Lake is 60 m. long and has many isls. The riv. is 200 m. long and a tributary of the Moose.

Ab'lett, Thomas Robert (1849-1915). Brit. art. teacher; founded Royal Drawing Soc., 1885. His system encouraged memory drawing.

ABOU-BEN-ADHEM

Abo (Finland). See Turku.

Abomasum. Fourth stomach of a ruminant, 6-471.

Abomey. Cap. of former kingdom of Dahomey, W. Africa, now one of the chief centres in the Fr. colony.

"Abominable snowman." Mysterious animal whose tracks have been found on Everest; footprints photographed by Shipton, 3-321.

Aborigines [abori'indz]. Name given by Romans to a people of cent. Italy, traditionally said to have descended from their mountain home near Reate upon Latium, where they settled down as Latins. Term now applied to original, or earliest known, inhabitants of any country; of Australia, 1-314, 317 illus.; 6-335 illus.; boomerang, 2-12; making fire, 3-356 illus.

Abou-ben-Adhem. In Leigh Hunt's poem, sees in a vision an angel writing "the names of those who love the Lord"; asks to be counted as one who loves his fellow-men, and

SOME COMMON ABBREVIATIONS

(Note: For Elements see Vol. 3, p. 224; For English counties see Fact-Index under England; for states of the United States see under United States.)

A

A.—Angstrom unit.
A.A.—Automobile (or Advertising, or Architectural) Association; Anti-aircraft.
A.A.A.—Amateur Athletic Association.
A.A.F.—Auxiliary Air Force.
A.A.I.—Associate of the Auctioneers' Institute.
A. and M.—Ancient and Modern (hymn-book).
A.B.—able-bodied seaman.
A.B.A.—Amateur Boxing Association.
A B C—the alphabet; alphabetical railway guide.
ab init.—*ab initio*, from the beginning.
A.C.—Alternating Current; Appeal Court.
A.C.A.—Associate of the Institute of Chartered Accountants.
a/c—account.
A.C.G.I.—Associate of the City and Guilds of London Institute.
A.C.I.M.—Associate of the Chartered Institute of Secretaries.
A.D.—*L. Anno Domini*, in the year of our Lord.
ad.—advertisement.
A.D.C.—aide-de-camp; Amateur Dramatic Club.
ad eund.—*L. ad eundem (gradum)* admitted to the same degree (at another university).
ad fin.—*L. ad finem*, at, to the end.
ad lib.—*L. ad libitum*, at pleasure.
Adm.—Admiral.
A.D.O.S.—Assistant Director of Ordnance Services.
ad val.—*L. ad valorem*, according to the value.
adv.—advertisement.
agrot.—*L. agrotat*, he is ill, in English universities, certificate that student is too ill to take exam.
act.—*actat*—*L. actatis*, aged (so many years).
A.E.U.—Amalgamated Engineering Union.
A.F.A.—Amateur Football Association.
A.F.C.—Air Force Cross.
A.F.M.—Air Force Medal.
A.F.R.Ae.S.—Associate Fellow of the Royal Aeronautical Society.
aft.—afternoon.
A.G.—Adjutant-General; Attorney-General; Accountant-General; Agent-General.

A.G.S.M.—Associate of the Guildhall School of Music.
A.I.—Auctioneers' Institute.
A.I.A.—Associate of the Institute of Actuaries.
A.I.C.E.—Associate of the Institution of Civil Engineers.
A.I.D.—Aeronautical Inspection Directorate.
A.I.Mech.E.—Associate of the Institution of Mechanical Engineers.
Ald.—Alderman.
A.R.T.C.—Associate of the Royal Institute of Chemistry.
A.I.S.A.—Associate of the Incorporated Secretaries' Association.
A.L.C.M.—Associate of the London College of Music.
A.L.S.—Associate of the Linnean Society.
a.m.—*L. ante meridiem*, before noon.
A.M.—Albert Medal.
A.M.D.G.—*L. ad maiorem Dei gloriam*, to the greater glory of God—motto of the Jesuits.
A.M.I.C.E.—Associate Member of the Institution of Civil Engineers.
A.M.I.E.E.—Associate Member of the Institution of Electrical Engineers.
A.M.I.Mech.E.—Associate Member of the Institution of Mechanical Engineers.
amp.—ampere.
anon.—anonymous.
A.N.Z.A.C. (Anzac)—Australian and New Zealand Army Corps.
A.O.D.—Ancient Order of Druids.
A.O.F.—Ancient Order of Foresters.
A.O.H.—Ancient Order of Hibernians.
A.P.M.—Assistant Provost-Marshal.
appro.—approval.
approx.—approximately.
A.Q.M.G.—Assistant Quarter-master-General.
A.R.A.—Associate of the Royal Academy.
A.R.A.M.—Associate of the Royal Academy of Music.
A.R.B.A.—Associate of the Royal Society of British Artists.
A.R.C.—Automobile Racing Club.
A.R.C.A.—Associate of the Royal College of Art; Associate of the Royal Cambrian Academy.
A.R.C.I.—Associate of the Royal Colonial Institute.

A.R.C.M.—Associate of the Royal College of Music.
A.R.C.O.—Associate of the Royal College of Organists.
A.R.C.S.—Associate of the Royal College of Science.
A.R.E.—Associate of the Royal Society of Painter-Etchers and Engravers.
A.R.H.A.—Associate of the Royal Hibernian Academy.
A.R.I.B.A.—Associate of the Royal Institute of British Architects.
A.R.M.S.—Associate of the Royal Society of Miniature Painters.
A.R.P.—Air Raid Precautions (Second World War).
A.R.P.S.—Associate of the Royal Photographic Society.
A.R.S.A.—Associate of the Royal Scottish Academy.
A.R.S.M.—Associate of the Royal School of Mines.
A.R.S.W.—Associate of the Royal Scottish Society of Painters in Water-Colours.
A.R.W.S.—Associate of the Royal Society of Painters in Water-Colours.
A.-S.—Anglo-Saxon.
A.S.A.A.—Associate of the Society of Incorporated Accountants and Auditors.
A.S.E.—Amalgamated Society of Engineers.
A.S.L.E. and F.—Associated Society of Locomotive Engineers and Firemen.
A.S.R.S.—Amalgamated Society of Railway Servants.
Assn.—association.
Asst.—assistant.
A.T.C.—Air Training Corps.
A.T.C.L.—Associate of Trinity (College of Music), London.
A.T.S.—Auxiliary Territorial Service (former name of Women's Royal Army Corps).
A.U.C.—*L. ab urbe condita*, or *anno urbis conditae*, in the year of, or from the foundation of the city (Rome).
A.V.—Authorised Version (Bible).
A.V.C.—Automatic volume control.
A.W.O.L.—Absent without official leave.

B

b.—born; bowled, bye (cricket).
B.A.—Bachelor of Arts; British Academy; British Association, Buenos Aires.
B. Agr.(ic).—Bachelor of Agriculture.

Bart.—Baronet.
Bart's.—St. Bartholomew's Hospital.
B.R.T.C.—British Board of Control.
B.R.C.—British Broadcasting Corporation.
B.C.—before Christ; British Columbia.
B.Ch.—*L. Baccalaureus Chirurgiae*, Bachelor of Surgery.
B.Ch.D.—Bachelor of Dental Surgery.
B.C.L.—Bachelor of Civil Law.
B.Com.—Bachelor of Commerce.
B.D.—Bachelor of Divinity.
B.D.S.—Bachelor of Dental Surgery.
B.Eng.—Bachelor of Engineering.
B.E.A.C.—British European Airways Corporation.
B.E.F.—British Expeditionary Force.
B.E.M.—British Empire Medal.
B.Eng.—Bachelor of Engineering.
B.è L.—*Fr. Bachelors Lettres*, Bachelor of Letters.
B. è S. Fr.—*Bachelier è Sciences*, Bachelor of Science.
b.f.—brought forward.
b.h.p.—brake-horse-power.
B.I.F.—British Industries Fair.
B.L.—Bachelor of Law.
b.l.—bill of lading.
B.Litt.—Bachelor of Letters.
B.Li.—Bachelor of Laws, more commonly LL.B.
B.M.—British Museum; Bachelor of Medicine, more commonly M.B.
B.M.A.—British Medical Association.
B.M.E.—Bachelor of Mining Engineering.
B.M.J.—British Medical Journal.
B.N.C.—Branthorpe College, Oxford.
B.O.A.C.—British Overseas Airways Corporation.
B.O.T.—Board of Trade.
B.R.—British Railways.
Brit.—Britain, Britannia, British.
Britt.—*L. Brit(t)an(n)iarum* of (all) the Britains, on coin.
Bros.—Brothers (commercial).
B.S.—Bachelor of Surgery; British Standard.
B.S.A.—British South Africa; Birmingham Small Arms Co.
B.Sc.—Bachelor of Science.
B.S.I.—British Standards Institution.
B.S.T.—British Summer Time.

ABOUKIR BAY

learns that the love of Man is the love of God.

Aboukir Bay. On N. coast of Egypt, w. of Rosetta mouth of Nile; Nelson and battle of the Nile, 5-383.

About (ah-bō'), Edmond François Valentin (1828-85). Fr. novelist and dramatist; works include *Contemporary Greece*; *Tolla*, a Tale of Modern Rome.

Above par. See *Stock Exchange Terms* (table).

Abracadabra. Magical word or formula derived from Coptic worship and supposed to conceal the name of God.

Abraham. Hebrew patriarch, 1-5; in Jewish hist., 4-373; birthplace, 7-369; tomb, 6-48 illus.

Abraham, Plains of. Heights near Quebec city, Canada, on N. bank of St. Lawrence r.; scene of Montcalm's defeat by Wolfe (1759), 5 249, 6 322, 7-165 with illus.

Abraham men. Able-bodied beggars of 16th-18th cent. A ward in Bethlehem Hospital (Bedlam), London,

which served lunatic beggars was called Abraham ward.

Abrahams, Harold Maurice (b. 1899). Brit. athlete; represented Gt. Brit. in Olympic Games 1920 and 1924; won the 100 metres sprint in 1921; captained Brit. team in 1923.

Abram (Hob. patriarch). See *Abraham*.

Abrams (zool.). See *Bream*.

Abrasions, first aid for, 3 368.

Abruzzi (ah-broō'sil, Luigi, Duke of the (1873-1933). It. royal prince, explorer, and scientist; first to ascend Mt. St. Elias, Alaska (1897); commanded It. fleet in 1st World War.

Abruzzi and Molise. Region in cent. Italy; area about 5,900 sq. m.; pop. 1,677,140; includes highest point of Apennines, Gran Sasso d' Italia (great rock of Italy), culminating in Monte Corno, 1-182, 4 304.

Ab'salom. Rebellious son of David; caught by his long hair in tree and slain (2 Sam. xiv-xviii), 3 31.

"**Ab'salom and Achitophel.**" Allegorical satire by Dryden, in which

ABUKIR BAY

Duke of Monmouth figures as Ab'salom, and Shaftesbury as Achitophel.

Ab'scess. A collection of pus in a body tissue.

Ab'scission layer. Layer of corky cells formed at the base of a leaf-stalk in autumn; why leaves fall, 4 472 with illus.

Ab'sinth. Alcoholic liquor prepared from flowers and leaves of worm-wood. The liquor is so strong that mfr. and sale are controlled in several European countries.

Absolute alcohol, the purest form, containing 95.5 per cent. alcohol, 1 96.

Absolute zero. -459.4° F., 3-465; in theory of heat, 4-146.

Absorption. In chemistry, the sucking up of one substance into the body of another; of colours, 2 463.

Abu Abdullah. See *Boabdil*.

Abu Bakr (573-631). First Mohammedan caliph, father-in-law of Mahomet; and the authentic Koran, 4 125.

Abukir Bay. See *Aboukir Bay*.

SOME COMMON ABBREVIATIONS (continued)

Bt Baronet.
B.Th Bachel. of Theology.
B.Th U.—British thermal unit.
B.T.U.—(elect.) Board of Trade unit.
B.V.M.—L. *Besta Virgo Maria*, the Blessed Virgin Mary.
L.W.G.—Birmingham wire gauge.
B.W.I.—British West Indies.

C

C.—L. *centum*, 100.
C.—Centurion.
C.—L. *circa, circum, circiter*, about, (cricket) caught.
C.—Chartered Accountant.
C.—A b caught and bowled (cricket).
C.—L. *Cantabrigiensis*, member of Cambridge University.
Cap.—L. *capitulum*, chapter; capital letter; number of statute in year of reign.
Capt.—Captain.
C.B.—Companion of the Bath; confined to barracks, a punishment in army.
C.B.E.—Commander of the Order of the British Empire.
C.—cubic centimetre.
C.F.—Combined Cadet Force.
C.D.—Civil Defence.
C.V.—Fr. *carte-de-visite* (photograph size).
C.E.—Civil Engineer; Chief Engineer; Christian Endeavour (society); Church of England.
Cent.—L. *centum*, 100; centigrade.
Cert.—certainty; certificate.
C.—L. *confer*, compare.
C.—L. carried forward.
C.G.I.—City and Guilds Institute.
C.G.S.—centimetre-gramine-second system of scientific measurement.
C.H.—Companion of Honour.
Ch.—Church.
Chas.—Charles.
Ch.B.—L. *Chirurgiae Baccalaureus*, Bachelor of Surgery.
Ch.M.—L. *Chirurgiae Magister*, Master of Surgery.
C.I.—Channel Islands; Institute of Commerce.
C.I.D.—Criminal Investigation Department, New Scotland Yard.
C.I.E.—Companion of the Order of the Indian Empire.
C.I.G.S.—Chief of the Imperial General Staff.
C.I.Mech.E.—Companion of the

Institution of Mechanical Engineers.
C.I.V.—City Imperial Volunteers (Boer War).
C.M.—L. *Chirurgiae Magister*, Master of Surgery.
cm.—centimetre.
Cmdr.—Commander.
C.M.G.—Companion of the Order of St Michael and St George.
C.M.S.—Church Missionary Society.
C.N.R.—Canadian National Railways; Civil Nursing Reserve.
C.O.—Commanding Officer, Conscientious Objector, Co. company, county.
c.o.—care of.
C.O.D.—cash on delivery.
C. of E.—Church of England.
Col.—Colonel.
Com.—Commander, Commissioner, Commodore.
Con.—L. *Contra*, against.
Cons.—Consolidated Stock.
Co-op.—Co-operative (Stores).
Cor. Fel.—Corresponding Fellow (of society or academy).
Cor. Mem.—Corresponding Member (of society or academy).
Cor. Sec.—Corresponding Secretary (of society or academy).
cos.—cosine (trigonometry).
C.P.R.—Canadian Pacific Railway.
Cr.—credit(or).
crase.—Ital. *crasendo*, with increasing loudness (music).
c/s—cycles per second.
C.S.I.—Companion of the Star of India.
C.T.C.—Cyclists' Touring Club.
cu—cubic.
C.V.O.—Commander of the Royal Victorian Order.
C.W.S.—Co-operative Wholesale Society.
cwt.—hundredweight.

D

D.—500 (Roman numeral).
d.—L. *denarius*, a penny; died.
D.B.E.—Dame Commander of the Order of the British Empire.
D.C.—direct current; District of Columbia (U.S.A.).
d.c.—Ital. *da capo*, repeat from the beginning (music).
D.C.L.—Doctor of Civil Law.
D.D.—Doctor of Divinity.
D.D.S.—Doctor of Dental Surgery.

D.D.T.—dichloro-diphenyl-trichlorethane.
del—delete (printing).
del(t).—L. *delectari*, he (she) drew (it).
D.Eng.—Doctor of Engineering.
D.F.—Defender of the Faith (more often *Fid. Def.* or *F.D.*).
D.F.C.—Distinguished Flying Cross.
D.F.M.—Distinguished Flying Medal.
D.G.—L. *Dei gratia*, by the Grace of God.
D.I.C.—Diploma of the Imperial College.
dim.—Ital. *diminuendo*, getting gradually softer (music).
div., divi—dividend.
D.Lit.—Doctor of Literature.
D.Litt.—(at Aberdeen) Doctor of Letters.
dm.—decimetre.
D.M.R.E.—Diploma in Medical Radiology and Electrolgy.
do—ditto Italian *detto*, the same.
D.O.M.—L. *Deo optimo maximo*, to God the best and greatest.
D.O.M.S.—Diploma in Ophthalmic Medicine and Surgery.
D.O.R.A.—Defence of the Realm Act(s).
D.P.H.—Diploma in, Department of, Public Health.
DR.—Dead reckoning.
Dr.—Doctor; debtor.
dr.—drachm.
D.S.C.—Distinguished Service Cross.
D.Sc.—Doctor of Science.
D.S.M.—Distinguished Service Medal.
D.S.O.—Distinguished Service Order.
D.T.M.—Diploma in Tropical Medicine.
D.V.—L. *Deo volente*, God willing.
L. M.—Doctor of Veterinary Medicine.
D.V.S.—Doctor of Veterinary Science or Surgery.
dwt.—pennyweight.
D.Z.—Doctor of Zoology.

E

E.—east.
E. & O.E.—errors and omissions excepted.
Edin.—Edinburgh.
e.g.—L. *exempli gratia*, for the sake of example.
E.G.M.—Empire Gallantry Medal.
e.m.d.p.—electromotive difference of potential.
e.m.f.—electromotive force.

e.m.u.—electromagnetic units.
E.N.S.A.—Entertainment National Service Association (Second World War).
E.P.D.—Excess Profits Duty.
E.P.N.S.—Electro-plated nickel silver.
E.P.T.—Excess Profits Tax.
E.R. L. *Elizabetha Regina*, Queen Elizabeth.
Esq.—Esquire.
e.s.u.—electrostatic units.
et al.—L. *et alibi*, and elsewhere, *et alio*, and other people; *et alia*, and other things, and the other things, and so forth.
et seq.—L. *et sequens*, et sequenti, and the following.
E.T.U.—Electrical Trades Union.

F

F.—Fahrenheit; farad (elect.).
f.—acceleration (mechanics); force; foot or feet.
f. Ital. *forte*, loud (music).
F.A.—Football Association.
Fahr.—Fahrenheit.
F.A.I.—Fellow of the Auctioneers' Institute.
F.A.N.Y.—First Aid Nursing Yeomanry.
F.A.O.—Food and Agricultural Organization (United Nations).
F.B.A.—Fellow of the British Academy.
F.B.H.—fire brigade hydrant.
F.B.I.—Federation of British Industries; Federal Bureau of Investigation (U.S.A.).
F.C.A.—Fellow of the Institute of Chartered Accountants.
F.C.G.I.—Fellow of the City and Guilds of London Institute.
F.C.I.I.—Fellow of the Chartered Insurance Institute.
F.C.I.S.—Fellow of the Chartered Institute of Secretaries.
fcp.—foolscap.
F.C.S.—Fellow of the Chemical Society.
F.D.—L. *Fidei Defensor*, defender of the faith.
fec.—L. *fecit*, he (she) did, made (it).
ff.—Ital. *fortissimo*, very loud (music).
F.F.A.—Fellow of the Faculty of Actuaries.
F.I.A.—Fellow of the Institute of Actuaries.
F.I.A.A.—Fellow (Architect Member) of the Incorporated Association of Architects and Surveyors.

ABUNA

Abuna. Coptic dignity, chief priest in Abyssinia, 1-6.
Abu Simbel. Locality in Egypt famous for its rock temples of Rameses II; colossi of Rameses, 3-191 illus.
Abydos (ab'idōs), Asia Minor. Anc. city at narrowest point of Hellespont, where Xerxes built bridge of boats; home of Leander.
Abydos, Egypt. Anc. city on Nile, once second only to Thebes; held sacred as burial-place of Osiris.
Abyssinia. Kingdom of N.E. Africa, also called Kithiopia; area 350,000 sq. m.; pop. 11,000,000 (with Eritrea, 12,000,000); cap Addis Ababa, 1-5; conquest by Italy 1933-39, 4-317, 7-485 481 illus.; liberation, 1941, 7-490; origin of name Ethiopia, 3-302; discovery of coffee, 2-411; Eritrean federation 3-295; flag, 3-385 illus. f.
Acacia (ak'ā'sha). Plant of the family Leguminosae; some 500 species 1-8.
Acad mie Française. See French Academy.
Academy. Gk. hero in whose honour a house was built at Athens in which Plato founded his school, 1-9.

Academy. An association or place for higher learning, 1-9.
Acadia, or Acadie. Name given by the French to former Fr. colony in N. Amer.; ceded to Brit. in 1713, and renamed Nova Scotia, 5-470.
Acapulco. Spt. in El Salvador; pop. 2,500; exports coffee, 6-493.
Acanthomyops nigra. Common black ant, 1-163.
Acanthus (akan'thus), a plant, found chiefly in the tropics and s. Europe; leaves inspired Corinthian capital in architecture.
Acapella. See Musical Terms (table).
Acapulco. Spt. on w. coast of Mexico, 230 m. s.w. of Mexico City; pop. 9,993; exports copper, fruit and hides, 5-186.
Acari (ak'ar'i). An order of arachnids including mites.
Accelerando. See Musical Terms (table).
Acceleration. Rate of change in speed or velocity of a moving body over a period of time. It is expressed in feet or centimetres per sec. per sec. 4-66; of sub-atomic particles, 3-17.
Accent. See Musical Terms (table).
Accentor. The so-called hedge sparrow 7-123

ACCRUED INTEREST

Accents. Pronunciation marks; in Gk., 4-92.
Accidental. See Musical Terms (table).
Accidents. Road accidents, 6-409; caused by dust explosions, 3-330; prevention by automatic devices, 1-327; in lifts, 4-496.
Accipitridae (zool.). Family of birds including eagles, hawks, buzzards and kites, 4-115.
Accolade. In ceremony of knighthood, 4-417.
Accountant. Person who has charge of the accounts of a business or other concern; as a career, 2-232, 2-11.
Accounting machine. 2-168 illus.
Accounts, book-keeping. 2-10.
Accra (akrah'). Cap. of Brit. Gold Coast Colony, W. Africa; rly. and air terminus; site of Achimota College; pop. 135,920; 4-11, 7-140.
Accrington. Tn. in Lancashire, 23 m. n.w. of Manchester; cotton industry, dyeing, chemicals, engineering; pop. 40,671; 4-144.
Accrued dividend. See Stock Exchange Terms (table).
Accrued interest. See Stock Exchange Terms (table).

SOME COMMON ABBREVIATIONS (continued)

F.I.A.C.—Fellow of the Institute of Company Accountants.
F.I.A.S.—Fellow (Surveyor Member) of the Incorporated Association of Architects and Surveyors.
F.I.C.A.—Fellow of the Institute of Chartered Accountants.
Fid. Def.—*Fideli Defensor* defender of the faith.
F.I.D.O.—Fog Investigation Dispersal Operation.
ill.—*illustration*.
F.I.Inst.—Fellow of the Imperial Institute.
F.I.I.A.—Fellow of the Institute of Industrial Administration.
F.Inst.P.—Fellow of the Institute of Physics.
F.I.O.—Fellow of the Institute of Ophthalmic Opticians.
F.I.S.A.—Fellow of the Incorporated Secretaries' Association.
F.J.I.—Fellow of the Institute of Journalists.
fl.—*L. floruit*, he (she) flourished.
F.L.A.A.—Fellow of London Association of Accountants.
F.L.A.S.—Fellow of the Land Agents' Society.
F.L.S.—Fellow of the Linnean Society.
F.M.—Field—Marshal; frequency modulation (radio).
F.O.—Foreign Office; Field Officer.
f.o.b.—free on board.
f.p.a.—free of particular average.
F.Phys.S.—Fellow of the Physical Society.
Fr.—French.
F.R.A.I.—Fellow of the Royal Anthropological Institute.
F.R.A.M.—Fellow of the Royal Academy of Music.
F.R.A.S.—Fellow of the Royal Astronomical Society, of the Royal Asiatic Society.
F.R.Ae.S.—Fellow of the Royal Aeronautical Society.
F.R.B.S.—Fellow of the Royal Botanic Society.
F.R.C.M.—Fellow of the Royal College of Music.
F.R.C.O.—Fellow of the Royal College of Organists.
F.R.C.P.—Fellow of the Royal College of Physicians.
F.R.C.S.—Fellow of the Royal College of Surgeons.
F.R.C.V.S.—Fellow of Royal Coll. of Veterinary Surgeons.
F.R.E.S.—Fellow of the Royal Empire Society.

F.R.Econ.Soc.—Fellow of the Royal Economic Society.
F.R.G.S.—Fellow of the Royal Geographical Society.
F.R.Hist.S.—Fellow of the Royal Historical Society.
F.R.Hort.S.—Fellow of the Royal Horticultural Society.
F.R.I.B.A.—Fellow of the Royal Institute of British Architects.
F.R.I.C.—Fellow of the Royal Institute of Chemistry.
F.R.Met.S.—Fellow of the Royal Meteorological Society.
F.R.M.S.—Fellow of the Royal Microscopical Society.
F.R.N.S.A.—Fellow of the Royal Naval School of Architects.
F.R.P.S.—Fellow of the Royal Photographic Society.
F.R.S.—Fellow of the Royal Society.
F.R.S.A.—Fellow of the Royal Society of Arts.
F.R.S.E.—Fellow of the Royal Society of Edinburgh.
F.R.S.L.—Fellow of the Royal Society of Literature.
f/s—foot-second.
F.S.A.—Fellow of the Society of Antiquaries.
F.S.A.A.—Fellow of the Society of Incorporated Accountants and Auditors.
F.S.I.—Fellow of the Surveyors Institute.
ft.—foot, feet.
F.Z.S.—Fellow of the Zoological Society of London.

G

g.—gram; gravity
gal.—gallon.
G.B.—Great Britain.
G.B.E.—Knight (or Dame) Grand Cross of British Empire.
G.C.—George Cross.
G.C.B.—Knight Grand Cross of the Order of the Bath.
G.C.F.—greatest common factor.
G.C.I.E.—Knight Grand Commander of the Indian Empire.
G.C.L.H.—Knight Grand Cross of the Legion of Honour.
G.C.M.—greatest common measure.
G.C.M.G.—Knight Grand Cross of St. Michael and St. George.
G.C.S.I.—Knight Grand Commander of the Star of India.
G.C.V.O.—Knight Grand Cross of the Royal Victorian Order.
Gen.—General.

Ger.—German.
G.H.Q.—General Headquarters.
G.I.—Government Issue (U.S.) colloquially, a U.S. soldier.
Gk.—Greek.
G.M.—George Medal, Grand Master (knighthood and freemasonry) Gold Medallist (Bisley).
gm.—gram(s).
G.M.C.—General Medical Council.
G.M.I.E.—Grand Master of the Order of the Indian Empire.
G.M.M.O.—Grand Master of the Order of St. Michael and St. George.
G.M.S.I.—Grand Master of the Star of India.
G.M.T.—Greenwich Mean Time.
gns.—galleons.
G.O.C.—General Officer Commanding.
G.O.M.—Grand Old Man (originally W. E. Gladstone).
G.P.O.—General Post Office.
G.R.—*L. Georgina Rex*, King George.
Gr.—Greek.
gr.—gram.
gm.—gram(s).
G.S.O.—General staff officer.
gym.—gymnasium, gymnastics.

H

H—Hydrant.
H.A.C.—Honourable Artillery Company.
h. & c.—hot and cold running water.
H.B.M.—Her (His) Britannic Majesty.
H.C.F.—highest common factor.
H.E.—His Eminence; His Excellency; high explosive.
H.F.—high frequency.
H.H.—His (Her) Highness His Holiness (the Pope).
hhd.—hoghead.
H.M.—Her (His) Majesty.
H.M.S.—Her (His) Majesty's Ship.
H.M.S.O.—Her (His) Majesty's Stationary Office.
H.O.—Home Office.
Hon.—Honourable, honorary.
H.P.—half-pay; horse-power; high pressure, hire-purchase.
H.Q.—headquarters.
hr.—hour.
H.R.H.—His (Her) Royal Highness.
H.T.—high tension.
H.W.M.—High-water mark.
Hy.—Henry.
hydro.—hydropathic centre.

I

I (Roman numeral) one ampere (electricity).
I.A.—Incorporated Accountant.
ib., *ibid*, *ibidem*, in the same place.
I.B.U.—International Boxing Union.
i.c.—internal combustion.
I.C.A.O.—International Civil Aviation Organization.
I.C.I.—Imperial Chemical Industries.
id., *id.*, *idem* the same.
I.D.B.—Illust diamond buying, buyer (South Africa).
I.D.C.—Imperial Defence College.
id est, *id est*, that is.
I.G.—Inspector-General.
i.h.p.—indicated horse-power.
I.H.S.—*L. Iesus Hominum Salvator*, Jesus Saviour of Mankind.
illus.—illustration.
I.L.O.—International Labour Organization.
I.L.P.—Independent Labour Party.
in inch.
inc.—incorporated; inclusive.
incl.—including; inclusive.
incog.—incognito (It. unknown).
inf.—*L. infra*, below.
infra dig.—*L. infra dignitatem* beneath one's dignity.
I.N.R.I.—*L. Iesus Nazarenus Rex Iudaeorum*, Jesus of Nazareth King of the Jews.
inst.—*L. Instante mense*, in the present month.
int.—interest.
I.O.G.T.—International Order of Good Templars.
I.O.M.—Isle of Man.
I.O.O.F.—Independent Order of Oddfellows.
I.O.U.—I owe you.
I.O.W.—Isle of Wight.
I.Q.—Intelligence quotient.
I.R.A.—Irish Republican Army.
Is.—Island(s).
Isl.—Island.
I.S.O.—Imperial Service Order.
I.T.A.—Independent Television Authority.
Ital.—Italian, Italian.
I.W.W.—Industrial Workers of the World.

J

Jap.—Japanese.
Jas.—James.
J.C.R.—Junior Common Room.
Jno.—John.

ACCUMULATOR

Accumulator. In electricity, a secondary cell that accumulates and stores current in the form of chemical energy. Correctly termed a storage battery. 1-387, with illus.

Acc. in golf, 4-46.

Acc. in pack of cards, 2 221.

Acet. The maple genus of trees, 5-117

Acetaldehyde, a colourless inflammable solvent liquid, made from alcohol and acetylene, 1-10.

Acetan. slide. A drug used in headache powders and as a febrifuge obtained from coal tar

Acetate yarn, info 6 369.

Acetic acid. Weak acid found in plant juices and in vinegar. Used extensively in chemical industries for producing acetates, atomic arrangement, 1 12, model of organic molecule, 2 320 illus.

Acetone. An organic compound used as a solvent, and absorbent in cylinders of acetylene in oxyacetylene equipment, 1 10

Acetylene. Colourless poisonous gas, a compound of carbon and hydrogen, C_2H_2 . Burns with very hot, bright

flame 1 9, structure and formula, 2-319, model of organic molecule, 2 320 illus

Acetylene lamps, uses, 4-443

Achaia (akéa) District of Greece on coast of Peloponneseus, Achaean League, a confederation of its cities, crushed by Rome, 116 BC

Achaean. One of the main divisions of the anc. Greeks. Term used by Homer for all Greeks

Achard, Franz (1733-1821) Ger. chemist and naturalist, and first sugar beet factory, 1 110

Achates (akátēs) In Virgil's *Aeneid* Trojan hero noted for loyalty to Aeneas, hence phrase *fides Achates* "fidelity Achates"

Achernar Star of the first magnitude 7 116

Acheron (akron) In Gk. mythology, river of underworld, also the underworld in general

Acherontia atropos See Death's Head Moth

Acheson (achison), **Dean G** (b 1834) Amer. statesman, successively asst. sec. 1911-13, under

ACHINESE

sec. 1915-47, and Secretary of State (1919-22), U.S. signatory of the North Atlantic Treaty April 4, 1949

Acheulan. Middle period of the lower Palaeolithic age in Europe when the warm climate gave way to a colder climate that implement 5 106 illus 107

Achill (ak d) Largest Isl. of Ireland part of co. Mayo, Irish Rep. 10 mi by 12 mi, pop. 4,800, tillage and turf cutting, knitting industry at Bough

Achill Head. Westernmost point of the Isl. of Achill Irish Rep.

Achilles (aklēs) Gk. hero in Homer's *Iliad* son of Peleus and Thetis 1 10 and Ajax 1 87, and the Amazons 1-130, chrys. Hector 4-152, 7 170

Achimota College, for Africans, estab. 1927 near Accra Gold Coast, comprising Secondary School and Teacher Training Coll., and in 1949 temporarily housing Gold Coast University Coll. 4 11

Achinese (achinez) Natives of Achin or Atchein, a former native

SOME COMMON ABBREVIATIONS (continued)

in junior
JP Justice of the Peace
in junior
JTC Junior Training Corps
junr junior

K

Kt Knight of the Bath
Kt L Knight Commander of the Order of the British Empire
KC King's Counsel
K kilovolt
K C Knight Commander of the Order of the Bath
K C L Knight Commander of the Order of the British Empire
K C MG Knight Commander of the Order of St. Michael and St. George
K C S Knight Commander of the Star of India
K C VO Knight Commander of the Royal Victorian Order
KG Knight of the Garter
kg kilogram
kg (a) kilogram(s)
kg (d) kilogram
kg (a) kilogram
kg (d) kilogram
Kt L Knight of the Legion of Honour
KM Knight of Malta
km kilometre (km² square kilometre)
K knock out (boxing)
KP Knight of the Order of St. Patrick
Kt L Knight Templar Knight of the Order of the Thistle
kt knight
kv kilovolt
kw kilowatt
Wh kilowatt hour(s)

L

L libra(e) pounds (money)
l (Roman numeral) fifty
le ruer (motoring)
l lake, left, Latin
l litre, lra
lat—Latin latitude
lb—Lb libra (e) pound(s) (weight)
lbw—lbw (cricket)
lbw—lbw before wicket (cricket)
l lower case (small letters as distinct from capital letters)
LC—London County Council
LCJ—Lord Chief Justice
LCM—least common multiple
lcl—lance corporal
ld—limited
LDS—Licentiate in Dental Surgery

lg—Ital. legato, smoothly (musical)
ll low frequency
llh left hand
lit—Licentiate
lit Hum—L *literae Humaniores*, final classical Hon. in School Oxford
litt B Bachelor of Letters
litt D—Doctor of Letters
LLA Lady Lecturer in Arts (St. Andrews Univ.)
ll B Bachelor of Laws
ll D Doctor of Laws
ll M Master of Laws
LMS London Missionary Society
lml Length mass time (physics)
loc of L loco citato in the place cited
l of C—Line(s) of communication
log—logarithm
log—logarithm (he) speaks
LP long playing (record)
LLO London Philharmonic Orchestra
LRAM—Licentiate of the Royal Academy of Music
LRP—Licentiate of the Royal College of Physicians
LRCS—Licentiate of the Royal College of Surgeons
LSD—L *librae solidi denarii* pounds shillings pence
LSI—London School of Economics
LSO London Symphony Orchestra
Lt—Lieutenant
LT—low tension
LTA—Lawn Tennis Association
Ltd—limited
LTI—London Transport Executive
LWM—low water mark

M

M—(Roman numeral) 1000
M—Monsieur
m mil(s), metres (m) miss (physics)
MA—Master of Arts
Maj—Major
M and B—Max and Baker (firm of chemists)
maths—mathematics
matric—matriculation
max—maximum
MB—Bachelor of Medicine
MBk—Member of the Order of the British Empire
MC—Master of Ceremonies
Military Cross, Movement Control

MCC—Marylebone Cricket Club
MC—L. Magistrate
MC Master of Surgery
MCom—Master of Commerce (Birmingham)
MComm—Master of Commerce and Administration (Manchester)
MD—Doctor of Medicine
MDS—Master of Dental Surgery
mch mechanism
mfg manufacturing
mem L memorandum
memorandum
mem L memorandum to be remembered
Messrs. Messieurs
mch used in English as plural of Mr
mf Ital. *mezzo-forte* moderate (loud) (music)
mid microfilm
MIL—Master of Foxhounds
mfrs—manufacturers
ng milligram(s)
Mnse—Monsieur
MCI—Member of the Institution of Civil Engineers
MChemE—Member of the Institution of Chemical Engineers
MII—Member of the Institution of Electrical Engineers
MIMechE—Member of the Institution of Mechanical Engineers
MInstCE—Member of the Institution of Civil Engineers
MInstMechE—Member of the Institution of Mechanical Engineers
MInstMinE—Member of the Institution of Mining Engineers
MII—Member of the Institution of Journalists
millibic(s)
M—Mademoiselle
MM—Messieurs
mm—millimetre (mm² square millimetre, mm³ cubic millimetre)
MM Military Medal
Mme Madame
MN—Merchant Navy
MO—Money Order, Medical Officer
Moxs Moderations (Oxford)
MOH—Medical Officer of Health, Ministry of Health
MOH—Ministry of Health
MOO—Money order office
MP—Member of Parliament
Metropolitan Police, Military Police
mp—Ital. *mezzo-piano*, moderately soft (musical)

mpg miles per gallon
mph miles per hour
MPS—Member of the Pharmaceutical Society, Philo-
sophical Society
Mr—Master
MRCS—Member of the Royal Asiatic Society, Member of the Royal Academy of Science
MRCP—Member of the Royal College of Physicians
MRCS—Member of the Royal College of Surgeons
MRCS—Member of the Royal College of Veterinary Surgeons
MRP—Member of the Royal Institution
Mrs—Mistress
MRSL—Member of the Royal Society of Literature
MS—Manuscript
MS—Master in Surgery
mstr ship
MSc—Master of Science
MSH—Master of Stag Hounds
MSL—Master level
MSS—manuscripts
MT—Master of Transport
Mt—mountain
Mus Bsc Bachelor of Music
Mus Doc Doctor of Music
MV—motor vessel motor vehicle muzzle velocity
MVO—Member of the Royal Victorian Order
MWI—Metropolitan Water Board

N

N north
NA—Nursing Auxiliary
NAVY—Navy Army, and Air Force Institutes
NAB—National Assistance Board
Nat national, natural
NAIO—North Atlantic Treaty Organization
NB—L. *nota bene* note well
North Britain, New Brunswick
nb no ball (cricket)
nco non-commissioned officer
nem con—L. *ne mone contra dicere*, "no one contra dicting," unopposed
NH—National Health Service
NI—Northern Ireland
No(s)—Ital. *numero* number(s)
no—not out (cricket)
non seq. I. *non sequitur* it does not follow
NP—Notary Public
np—not personality.

ACHRAY

kingdom, Atjeh, at N. end of Sumatra; of shorter stature and darker colour than other Sumatrans. Achray, Leesh, Perthshire, Scot.; length 13 m., width 4 m.; mentioned in Scott's poem, *The Lady of the Lake*, 6-138; 6-511.

Acids and Bases, in chemistry, 1-11; alkalis, 1-111; acid-resistance of aluminium, 1-128.

Acis. In Gk. myth., a shepherd beloved by the nymph Galatea, and slain by his rival Polyphemus the Cyclops. Story used by Handel in his opera *Acis and Galatea*.

Aclim's Line, or Magnetic Equator. An imaginary irregular line round the earth, near geographical equator, marking perfect balance between attraction of North and South Magnetic Poles; at any point of this line the compass needle does not dip.

Acne. Inflammation of the ducts of the sebaceous or oil glands of the skin, chiefly affecting face, back of neck, chest and back.

Acolyte. In R.C. church, cleric of the 4th minor order, ranking next to a subdeacon; originally a candle-bearer.

Aconagusa [ahkonkah'gwa]. Peak of Andes (23,000 ft.); gives its name to river and prov. in Chile; 1-149, 2-357. Until 1956 reputed highest mt. in S. America.

Aconidine, an alkaloid poison, 6-236.

Aconitum. A genus of about 70

species of poisonous plants of the buttercup family, including some medicinal species; also called monk's-hood, from large showy flowers with hooded sepals.

Acorn. Fruit of the oak tree, botanically a nut, standing in a cup of consolidated bracts. Varies in size according to species.

Acorn barnacle. Small sea creature enclosed in a shell. Common around Brit. coasts where it may be found in large clusters at low tide.

Acoustic mine, used in naval warfare, 5-219 illus., 5-220.

Acoustics [akoh'tiks or akow'tiks]. Science of sound.

Acre. Spt. tn. of Israel, 80 m. N.N.W. of Jerusalem; pop. 9,800; taken by Richard the Lion Hearted in 3rd Crusade, 6-398, 3-2.

Acre. Riv. of Brazil, rises on Bolivian frontier and flows E. and N. to riv. Purús. Also a state 59,139 sq. m., rich in rubber forests. Chief tn. Rio Branco.

Acre. Unit of land measure (4,840 sq. yd.). See **Weights and Measures**.

Acerididae. Family of insects including locusts and grasshoppers with short antennae, 4-65.

Acropolis. Terraced hill with public buildings in anc. Athens, 1-12; temple of Wingless Victory, 4-82 illus.

Acoropa hyacinthus. Species of coral, 5-128 illus. f.

ACT OF UNION

Aeropera prolifera. Species of coral, 5-128 illus. f.

Acroëde. A puzzle, competition, or verse form in which the initial, and sometimes final letters of the lines form words.

Acta Diurna (Daily Events). Short notices of general news posted up in public places in anc. Rome; as forerunner of the news-letter, 5-407.

Actaeon. In Gk. myth., famous hunter who spied on Diana bathing. In punishment he was changed by her into a stag and torn to pieces by his own hounds.

Actia Nicopolis. See **Nicomedia**.

Acting (theatre). See **Drama**; **Theatre**.

Actinism. Property of light by which chemical changes are produced; makes photography possible.

Actinium (Ac). A radio-active element of the actinium group; atomic weight, 227; disintegration product of the element protactinium, occurring in pitchblende; radio-active properties, 3-244.

Actinomyces. A disease of cattle and man, characterised by tumours of the mouth and jaws, and caused by a fungus.

Actium [akt'ium]. Promontory of N.W. Greece; scene of naval battle, 31 B.C., between Mark Antony and Agrippa; defeat of Antony, 1-309, 2-407; 5-129; galleys used at, 5-353.

Act of Union (1536), by it, Wales absorbed into the Tudor realm, 7-413.

SOME COMMON ABBREVIATIONS (continued)

N.R.—National Register.
N.E.A.—National Rifle Association.
N.S.—New Style, of Gregorian Calendar; Nova Scotia; *L. non satis*, not sufficient (funds), on cheque.
N.S.O.—Naval staff officer.
N.S.P.C.C.—National Society for the Prevention of Cruelty to Children.
N.S.W.—New South Wales.
N.T.—New Testament; Northern Territory (Australia).
N.U.J.—National Union of Journalists.
N.U.W.—National Union of Railwaymen.
N.W.T.—North-Western Territories (Canada).
N.Z.—New Zealand.

O

o/a—on account.
ob.—obit. died.
O.B.E.—Officer of the Order of the British Empire.
Oblt.—Obituary.
O.C.—Officer Commanding.
O.C.S.—Officer Cadet School.
O.E.—Old English.
O.H.M.S.—On Her (His) Majesty's Service.
O.M.—Order of Merit.
Ont.—Ontario.
O.P.—opposite prompt (theatre); out of print.
o.p.—over proof (spirits).
op.—*L. opus*, a work.
op. cit.—*L. opere citato*, in the work cited.
O.S.—Old Style (calendar), outside (garment).
O.S.B.—Order of St. Benedict.
O.T.—Old Testament.
O.U.D.S.—Oxford University Dramatic Society.
O.U.P.—Oxford University Press.
Oxon.—*L. Oxoniensis*, member of Oxford University.
oz.—ounce(s).

P. & O.—Peninsular and Oriental (steamship line).
par.—paragraph.
P.A.Y.E.—pay as you earn (Income Tax).
P.C.—Privy Council; Privy Councillor; Police Constable.
p.c.—*L. per centum*, by the hundred; post card.
P.E.P.—Political Economic Planning.
per cent.—*L. per centum*, per hundred.
per pro.—*per procuracionem*, by proxy, as agent.
pf.—Ital. *piano-forte*, soft, then loud (music).
Ph.B.—Bachelor of Philosophy.
Ph.D.—Doctor of Philosophy.
P.L.A.—Port of London Authority.
P.M.—Prime Minister; Paymaster.
p.m.—*L. post meridiem*, after noon.
P.M.G.—Postmaster-General.
P.O.—Post Office, postal order; petty officer (naval).
P.O.O.—Post Office Order.
pop.—population.
p.p.—*L. per pro* (q.v.).
pp.—pages.
pp—Ital. *pianissimo*, very soft (music).
p.p.c.—Picture post card.
ppp—Ital. *pianississimo*, as soft as possible (music).
P.P.S.—additional postscript; Parliamentary and Private Secretary.
P.R.—Proportional Representation.
P.R.A.—President of the Royal Academy.
Preb.—Prebendary.
pref.—preference; preferred (stock or shares).
prep.—preparation; preparatory (school, etc.).
pro.—professional (golf, etc.).
P.R.O.—Public Relations Officer.
Proc.—Proceedings (of learned society).
Prof.—Professor.
Prom.—promenade; promontory.
Proms.—Promenade concerts.
pro tem.—*L. pro tempore*, for the time being.

prox.—*L. proximo* (month), in the next month.
P.R.M.—President of the Royal Society.
P.R.S.A.—President of the Royal Scottish Academy.
P.S.—*L. post scriptum*, postscript.
p.s.—(military) passed School (of instruction).
p.s.a.—graduate of the Royal Air Force Staff College.
p.s.c.—graduate of the Military (or Naval) Staff College.
P.T.—physical training.
Pt.—Point, Port.
P.T.O.—please turn over.
p.v.c.—polyvinyl chloride.
P.W.D.—Public Works Department.

Q

Q.C.—Queen's Counsel.
Q.E.D.—*L. quod erat demonstrandum*, which was to be proved (theorem).
Q.E.F.—*L. quod erat faciendum*, which was to be done (problem).
Q.M.—Queen's Messenger.
Q.M.G.—Quartermaster-General.
qq.v.—*L. quae vide*, which (things) see.
qt.—quart.
quad.—quadrangle, quadrant.
q.v.—*L. quod vide*, which see.

R

R.—*L. rex*, king; *L. regina*, queen; right; river; Réaumur (thermometer).
R.A.—Royal Academy; Royal Academician; Royal Artillery; Rear-Admiral; Road Association.
R.A.C.—Royal Automobile Club; Royal Armoured Corps.
R.A.D.A.—Royal Academy of Dramatic Art.
R.A.E.C.—Royal Army Educational Corps.
R.A.F.—Royal Air Force.
R.A.F.V.E.—Royal Air Force Volunteer Reserve.
rall.—Ital. *rallentando*, becoming slower (music).

R.A.M.—Royal Academy of Music.
R.A.M.C.—Royal Army Medical Corps.
R.A.O.B.—Royal Antediluvian Order of Buffaloes.
R.A.O.C.—Royal Army Ordnance Corps.
R.A.P.C.—Royal Army Pay Corps.
R.A.R.O.—Regular Army Reserve of Officers.
R.A.S.—Royal Asiatic Society; Royal Astronomical Society.
R.A.S.C.—Royal Army Service Corps.
R.A.V.C.—Royal Army Veterinary Corps.
R.B.—Rifle Brigade.
R.B.A.—Royal Society of British Artists.
R.B.S.—Royal Society of British Sculptors.
R.C.—Roman Catholic.
R.C.M.P.—Royal Corps of Military Police.
R.D.—refer to drawer (on cheque).
Rd.—Road.
R.D.I.—Royal Designer for Industry.
R.E.—Royal Engineers.
recd.—received.
ref.—reference; reference.
Reg.—*L. regina*, Queen.
Reg. Prof.—Regius Professor.
R.E.M.E.—Royal Electrical and Mechanical Engineers.
Rev.—Reverend.
rev.—revolution (mechanics).
R.F.U.—Rugby Football Union.
r.h.—right hand.
R.G.S.—Royal Geographical Society.
R.H.S.—Royal Horticultural Society; Royal Historical Society.
R.I.—Royal Institute of Painters in Water Colours; Royal Institution.
R.I.B.A.—Royal Institute of British Architects.
R.I.P.—*L. requiescat in pace*, may he (she) rest in peace.
rit(ard)—Ital. *ritardando*, gradually slower (music).
R.L.O.—Returned Letter Office.
R.L.S.—Robert Louis Stevenson.
Rly.—Railway.
R.M.—Royal Marine.

P.—car park.
p.—page.
p—Ital. *piano*, soft (music).
p.a.—*L. per annum*, yearly.

ACT OF UNION

Act of Union (1707), united Scot. to Eng.; and official title of Gt. Brit., 4-88, 6-513, 6-510, 7-347.
Act of Union (1800), Ireland gives up separate parliament, 4-282.
Acton, John Emerich, 1st Baron (1834-1902), Eng. historian and editor; led liberal Cath. movement in Eng.
Acton, Por. of Middx., Eng., 7 m. w. of City of London: pop. 67,424; engineering works, printing, food products, laundries; 8-27, 8-200.
Acts of the Apostles, 5th book of New Testament, giving history of Church from Ascension of Christ to imprisonment of St. Paul in Rome.
Actuarial work, as a career, 2-232.
A.D. (Anno Domini), in calendar reckoning, 2-174.
Adagio, in music, 6-305.
Adalia, Spt. of Turkey in s. Asia Minor; important trade centre; pop. 28,000.
Adalia bipunctata, See Ladybird.
Adam, Robert (1728-92), Scot. architect, creator of the "Adam style" of interior decoration, 1-14; style, 4-217; furniture, 3-491.
Adam, Mt., in W. Falkland, Falkland Isles: height 2,315 ft., 3-330.
Adam and Eve, in the Bible, the first man and woman, 1-15; in *Paradise Lost*, 5-211.
Adamant, A synonym for diamond and also for lodestone.
Adamawa (adshinal'wah), Former native kingdom of W.-Cent. Africa,

divided between Nigeria and Cameroon; largely mountainous, with thick forests. Palm and banana grown extensively; trade in ivory and rubber.
Adam brothers, Scottish architects. See *an et Adam, Robert*.
Adams, John (1735-1826), 2nd President of U.S.A. (1796-1800). First Amer. minister to Gt. Brit. and 1st vice pres. Father of John Quincy Adams.
Adams, John (c. 1760-1829), Assumed name of Alexander Smith, one of the mutineers of the *Bounty*, 2-27.
Adams, John Couch (1819-92), Brit. astronomer who discovered the planet Neptune in 1845.
Adams, John Quincy (1767-1848), 6th Pres. of the U.S.A. (1821-28), son of John Adams. As Sec. of State under Pres. Monroe (1817-21) he secured Florida from Spain. Supported slave emancipation.
Adam's apple, Projection of larynx in front of throat; origin of term, 1-185; and vocal cords, 7-404 with illus.
Adam's Bridge, Reefs and sand banks between India and Ceylon.
Adam's Peak, Mt. in Ceylon (7,350 ft.); a place of pilgrimage, 44 m. e. of Colombo, 2-297.
Adana (ahdah'nah) or Seyhan, City and vilayet of Turkey in s.e. Asia Minor; pop. civ. 100,300, vilayet, 387,000; strategic position near pass-*os* of Taurus Mts.

ADELPHI

Addax, Antelope native to N. Africa and Arabia, 3 ft. high. Colour yellowish-white; shaggy brown hair on forehead and throat; ringed horns.
Adder or viper, Only poisonous snake in Gt. Brit. Length up to 25 ins. The flattened head has two dark bands converging as a V; dark zigzag line along back; row of dark patches along either side, 7-102 with illus.
Addis Ababa, Cap. of Abyssinia; pop. 300,000, 1-7, with illus. in Second World War, 7-480.
Addison, Joseph (1673-1719), Eng. essayist. With Steele contributed to *Tatler* and *Spectator*; wrote tragedy, *Cato*, 1-15; essays, 3-287, 7-134.
Addition, in arithmetic, 1-16; of decimals, 3-38; of fractions, 3-429.
Address, forms of, in speaking and writing, 7-283-83.
Adelaide, Queen (1792-1849), Consort of William IV of England; Adelaide named after, 1-18.
Adelaide, Cap. of S. Australia; pop. 410,000, 1-18, 7-102.
Adelle Land, A portion of the Antarctic Continent, discovered by Dumont d'Urville, a Frenchman, in 1840; sheer cliffs of ice; has whaling possibilities.
Adelphi, London terrace built by the Adam brothers (and so called from the Gk. "brothers") in 1769. Pulled down in 1936, 1-14.
"Adelphi" ("The Brothers"), Latin comedy by Terence based partly on

SOME COMMON ABBREVIATIONS (concluded)

RMA - Royal Military Academy
 RMO - Resident Medical Officer
 RMS - Royal Mail Steamer
 RN - Royal Navy
 RNC - Royal Naval College
 RNLi - Royal National Lifeboat Institution
 RNR - Royal Naval Reserve
 RNSR - Royal Naval Special Reserve
 RNVN - Royal Naval Volunteer Reserve
 Robt - Robert
 ROF - Royal Ordnance Factory
 ROI - Royal Institute of Oil Painters
 rpm - revolutions per minute, rps - ruceps
 RSPSR - Russian Soviet Federal Socialist Republic
 RSPCA - Royal Society for the Prevention of Cruelty to Animals
 RSPS - Royal Society of Portrait Painters
 RSVF - Fr. *Repondez s'il vous plait*, please reply.
 RT - Radio telephony
 RTC - Royal Tank Corps
 Rt Hon. - Right Honourable
 Rt Rev - Right Reverend
 RV - Revised Version (of the Bible); rendezvous.
 RW.S. - Royal Society of Painters in Water-Colours.
 Ry - Railway
 R.Y.S. - Royal Yacht Squadron.

S

S. - south, Saint.
 s. - L. *solidus*, shilling.
 SA - S. th Africa; (Ger.) *Sturm Abteilung* (Storm Division).
 sax. - saxophone.
 s.c. - small capital letters (type).
 s. caps. - small capital letters.
 sculpn. - L. *sculptor*, he (she) engraved (it).
 sec. - secretary.
 sec. - second.
 senr. - senior.
 seq., seqq. - L. *sequens*, *sequentia*, the following.

sf - Ital. *sforzando*, with sudden emphasis (music).
 S.G. - specific gravity
 SHAPE - Supreme Headquarters Allied Powers in Europe.
 sh p. - shaft horse-power.
 S.I.B. - Special Investigation Branch.
 S.I.C. - specific inductive capacity.
 sin - sine (trigonometry)
 ing - singular (grammar)
 SJ - Society of Jesus (Jesuits).
 S.O. - Sub-office (postal)
 S.P. - Starting point; self-propelled.
 S.P.C.K. - Society for the Promotion of Christian Knowledge.
 SPG - Society for the Propagation of the Gospel
 sp. gr. - Specific gravity
 SPQR - L. *Senatus Populusque Romanus*, the Roman Senate and People, small profits and quick returns
 sq - square.
 sr - Senator.
 SRN - State Registered Nurse
 S.S. - steamship, (Ger.) *Schutz Staffeln* (Protective Squads).
 SS - Saints.
 St. - Saint; Strait, Street.
 st. - stone (weight); stumped (cricket).
 stn. - station.
 Supt. - Superintendent.
 s.v. - L. *sub voce*, under the word, heading
 S.W.G. - standard wire gauge
 S.Y. - steam yacht.

T

t - time (physics).
 T.A. - Territorial Army, telegraphic address
 tan - tangent.
 T.B. - tuberculosis.
 T.C.D. - Trinity College, Dublin.
 T.D. - Territorial Decoration.
 temp. - L. *tempore*, in the time of; temperature.
 Three (3) D - Three-dimensional (films).
 T.M.O. - Telegraph Money Order.
 T.N.T. - trinitrotoluene.

TO - Turn over, telegraph office
 Toe H. - Talbot House.
 TRH - Their Royal Highnesses
 trs - transpose (type).
 T.S.F. - Fr. *telegraphie, telephone sans fil*, wireless.
 TT - Tourist Trophy, torpedo tubes; testotaller, tuberculin tested
 T.U.C. - Trades Union Congress, Trades Union Council
 T.V. - television.
 TVA - Tennessee Valley Authority

U

U.A.B. - Unemployment Assistance Board
 u.c. - upper case (printer's description of capital letters).
 U.D.C. - Urban District Council.
 U.K. - United Kingdom.
 ult. - L. *ultima* (mar), last month
 U.N. - United Nations
 U.N.A. - United Nations Association
 U.N.E.S.C.O. - United Nations Educational, Scientific, and Cultural Organization
 U.N.O. - United Nations Organization
 u.p. - under press (spirits).
 U.S. - United States, United States
 U.S.A. - United States of America.
 U.S.S.R. - Union of Soviet Socialist Republics.

V

V - five (Roman numeral), volt.
 v. - L. *versus*, against; verse; very.
 V.A.D. - Voluntary Aid Detachment.
 val. - valency (chemistry).
 V.C. - Victoria Cross.
 V.D.H. - valvular disease of the heart.
 Ven. - Venerable.
 verb. (sat.) sap - L. *verbum sapientia*, a word is enough to the wise.

V.H.F. - Very high-frequency (radio wavelengths).
 V.I.P. - Very Important Person (in facious use)
 viz - L. *videlicet*, namely
 vol. - volume
 V.P. - vanishing point.
 V.R. - velocity ratio
 V Rev - Very Reverend.

W

W - west.
 W.A. - Western Australia.
 W.A.A.C. - Women's Army Auxiliary Corps (1914-18war).
 W.A.F. - Women's Auxiliary Air Force.
 W.C. - water-closet.
 W.D. - War Department
 w.f. - wrong fount (printing)
 w.g. - wire gauge.
 W.H.O. - World Health Organization
 W.I. - West Indies Women's Institute.
 W.L. - Wavelength.
 W.O. - War Office warrant officer.
 W.P.B. - waste-paper basket.
 W.R.A.C. - Women's Royal Army Corps.
 W.R.A.F. - Women's Royal Air Force.
 W.R.N.S. - Women's Royal Naval Service.
 W.S. - Writer to the Signet.
 W.T. - Wireless telegraphy.
 wt. - weight.
 W.V.S. - Women's Voluntary Services.

X

X - ten (Roman numeral).
 x.op. - excluding coupon
 x.d., x.div. - excluding dividend.
 Xmas - Christmas.
 Xb(ian) - Christ(ian).

Y

Yeo. - Yeomanry.
 Y.H.A. - Youth Hostels Association.
 Y.M.C.A. - Young Men's Christian Association.
 Y.W.C.A. - Young Women's Christian Association.

ADEN

one in Greek by Menander; treats question of whether it is better to up children indulgently or

Aden. Brit. crown colony, protectorate and town, guarding the s. entrance to Red Sea. 1-18; Aden protectorate, area 112,000 sq. m., 1-19; Aden city, 1-191.

Adenauer, Konrad (b. 1876). Ger. politician (Christian Democrat); Prime min. of W. German Federal Republic from 1918, 2-456, 4-12.

Adenoids. Excessive growth of tissue in the nasal pharynx, commonest between ages of 3 and 18; can be removed by operation, 4-224.

Ader, Clément (1846-1925). Fr. aeronaut who built flying machines driven by steam, 1-30, illus., 1-37.

Adige. River of N. Italy, rises in Throlose Alps and empties into Gulf of Venice; about 240 m. long, 4-304.

Adirondack (adiron'dak) Mts. in N.E. New York, U.S.A., highest summit, Mt. Marcy, 5-421 illus.

Adjective. In grammar, 1-19, 4-56; comparison of, 1-20 illus. f.

Adjudant Vincenot. Fr. airship, 1-83 illus.

Adjutant. Army or R.A.F. officer 1-20.

Adjutant Bird. A large s. Indian stork, 1-20.

Adler, Alfred (1870-1937). Austrian psychologist and psychiatrist, associated with Freud but broke away from psycho-analytic school and founded Society for Individual Psychology; explained maladjustment as due to "inferiority complex"; 6-165; portrait 6-300 illus.

Admiral. Naval rank, 1-20; insignia 5-354 illus.

Admiral of the Fleet. in Royal Navy, insignia, 5-354 illus.

Admiralty Board of. Br. govt. dept. having supreme charge of naval affairs, 1-20.

Admiralty Arch. London, 5-24, 5-31 illus.

Admiralty Islands. Group of small isls. in Bismarck Archipelago; native pop. 13,400; area 600 sq. m.; coconuts, pearls; in Australian trust territory of New Guinea.

Admiralty Law. Legal system governing criminal and civil cases arising on the high seas; originally administered in Eng. by Lord High Admiral.

Adobe (ad'ô'bî), sun-dried brick, or the clay of which bricks are made. Used for building in arid regions of Mexico and N.W. states of the U.S.A.

Adolescence. stage of growth and development in boys and girls, round about the age of 14 or 15; and voice, 7-404.

Adonais. Elegy on the death of John Keats by Percy Bysshe Shelley, 7-26.

Adonis. In Gk. myth., a youth famous for his beauty, beloved by Aphrodite. When he was killed by a wild boar, her grief was so great that Zeus allowed him to alternate six months among the living with six among the dead.

Adonis Blues. See Clifden butterfly.

Adoption of children, and Curtis report, 2-353.

Adour. r. of France. Rises in Pyrenees and flows over 200 m. N. and W. to Bay of Biscay below Bayonne; navigable for about 80 m., and in parts is canalised, 6-314.

Adowa (ad'ô'wa). Tn. in Abyssinia, pop. 5,000; scene of Italian defeat in 1896.

Adrenal glands. Two flattened, yellowish brown, 2 in. long formations on upper anterior surface of the kidneys; and emotion, 3-241.

Adrenalin. Secretion produced by the adrenal or suprarenal glands; effect on body, 3-241, 4-38.

Adria, In. Italy, whence the Adriatic takes its name; location, 1-21.

Adrian, St. Patron saint of soldiers. A Rom. soldier, converted by witness-

ing heroism of Christian martyrs. Put to death in Nicomedia in 303. Festival day, Sept. 9.

Adrian IV (1100?-59). Nicholas Break-spear, only Eng. Pope: elected 1154; quarrelled with the Emperor Frederick Barbarossa, initiating long contest between Papacy and house of Hohenstaufen.

Adrianople. City of Turkey, called Edirne by the Turks. Built by Emp. Hadrian c. A.D. 125; pop. 46,440, battle of, 4-49.

Adrianople, Peace of (1829), between Russia and Turkey, secured Gk. independence.

Adriatic Sea. An arm of the Mediterranean, s. of Italy, 1-20; Venice and 7-387-88.

Adullam, Cave of, David and, 3-54.

Adur, riv. of Sussex, Eng., about 20 m. long. Enters Eng. Channel at Shoreham.

Advent. The four weeks preceding Christmas, reckoned from the Sunday nearest St. Andrew's day, Nov. 30. Advent begins the church year.

Adventure stories for children, 2-356.

Adverb 1-21 4-55; and adjective 1-19.

Advertising. 1-21, as a career, 2-232; in newspapers, 5-105.

Advocates' Library. Library of the Faculty of Advocates, in Edinburgh, Scot.; founded in 1682.

"Æ." Pen name of George William Russell (1867-1935), Irish lyric poet, essayist, painter, and nationalist leader.

Aediles. Civil servants in the Rom. Empire; duties, 2-405.

Aegean archipelago, modern political history, 1-25.

Aegean Civilization. Pro-Hellenic civilization (c. 3000-1200 B.C.) in Crete and neighbouring isls., 1-22.

Aegean Sea. Arm of Mediterranean between mainland of Greece and Asia Minor; spread of Cretan culture, 1-22 (map); origin of name, 7-269; 7-334 (map).

Aegeus. Mythical king of Athens, father of Theseus, 7-267-68.

Aegina (êj'î-na). Gk. isl. in Saronic Gulf; 40 sq. m.; important anc. state, conquered by Athens c. 456 B.C.

Aegis. In Gk. myth., shield of Zeus, or of Athene. Word used nowadays to imply protection in its general sense.

Aegisthus (êj's'thus). In Gk. myth., son of Thyestes and adopted son of Atreus, whom he slew; aided Clytemnestra in slaying Agamemnon, his cousin, 1-87.

Aegospotami [êgospot'amî]. Anc. name of small strait on Peninsula of Gallipoli, emptying into Helles pont.

Ælfric (c. 955-1022). Celebrated English scholar; called Grammaricus from his Latin Grammar, wrote a life of Æthelwold, whose pupil he was; chiefly famous for his Homilies, and an early school book, 2-336.

Æmilian (êmil'ian) Way. Road in anc. Italy over 180 m. long. Rimini to Milan; built 187 B.C.

Æneas (ên'ê-as). Trojan hero of Virgil's *Æneid*, son of goddess Aphrodite and Anchises, 1-25.

Æneid. Epic poem by Virgil; Æneas as hero, 1-25, 7-402; story of Wooden Horse at Troy, 7-320, 321 with illus.

Æolian Islands. See Lipari Isls.

Æolians. One of the four great divisions of the Gk. race.

Æolic dialect of anc. Greece, 4-71.

Æolus. In Gk. myth., ruler of the winds, he was the son of Poseidon (Neptune); gave his name to Æolian harp, a stringed mus. instr. played by winds.

Æpyornis. Prehistoric flightless bird, 6-282; remains in Madagascar 5-65.

Aerial. Any exposed wire able to radiate or receive energy to or from an electromagnetic wave. A radio receiving aerial, correctly antenna, is a conductor which receives the high

AFRICA

frequency oscillations broadcast from the transmitting aerial; beam aerial, 6-345 illus.; directional aerial, 6-338; and television, 7-283; and radio, 6-340 illus. f.

Aerial perspective. in art, 6-137.

Aerobes. Amer. high-altitude exploring rocket, 6-424, illus.

Aerodrome. Name formerly applied to flying machine, now given to flying grounds and stations; military camouflage, 2-181; fog precautions, 3-405; firefighting, 1-262, illus.

Aerodynamics. That branch of the mechanics of fluids that deals with the dynamics of gases. Particularly, the study of forces acting upon bodies in motion in air. In aeronautical design, aerodynamics is the shaping of an aircraft so that it offers the least resistance to the air and thereby reduces drag.

Aerofoil. See Aeronautics (table).

Aerolites. See Meteorites.

Aeronautical engineering, as a career, 2-232.

Aeronautics. See Aeronautics (table); Aeroplans; Airship; Balloon.

Aeroplans. 1-27; aluminum alloys in use, 1-129; bomb-aiming, 1-512; aircraft carriers, 6-343; detection by radar, 6-337; form of periscope used in, 6-126; jet-engined aircraft, 4-368; navigation, 4-114; 6-340 illus., 6-341; compass, 2-475, with illus.; heights judged by barometer, 1-371; gravitation and centrifugal force in, 2-204; minelaying from, 6-221; rocket-assisted take off, 6-123; model making, 5-230. See also Aeronautics (table); Air Records; Air Transport; "Autogiro"; Glider; Helicopter; Royal Air Force.

Aeroplans, pilotless, as guided missile 4-103.

Aerosol. Form of colloid, 2-455.

Aeschines (êsk'in'z) (389-314 B.C.). Athenian orator and statesman.

Aeschylus (êsk'il'us) (525-456 B.C.). Gk. tragic dramatist, 1-45, 3-116; *Prometheus Bound*, 6-294.

Aesculapius (êsk'il'api-us). Greek physician, 1-45.

Aesculus hippocastanum. See Horse Chestnut.

Aesop (c. 620-560 B.C.). Gk. slave, teller of fables, 1-45.

Aesthetics. Branch of philosophy, 6-160.

Aestivation. Summer sleep of certain creatures, similar to hibernation (winter sleep); of crocodiles, 4-173.

Aetas. Pygmy people of the Philippine Isls., 6-312.

Aetius (ê'sh'ius) (d. 454). Rom. general, saviour of Europe by his victory (451) over Attila at Châlons; murdered by Valentinian III; and Attila, 1-306.

Aethelstan. See Athelstan.

Aetolia (ê'tô'li-a). District of Greece N. of Gulf of Corinth; Aetolian League became chief rival of Achaean League in the 4th and 3rd cents. B.C.

Afferent nerves, in human body: work of, 5-368.

Afforestation. The planting of trees on land which is naturally bare or has not carried trees for some period. In Gt. Brit. is controlled by the Forestry Commission.

Affray (British submarine). Sank in English Channel in 1951; the wreck, in 258 ft. of water, identified by means of an underwater television camera; 7-254 illus.

Afghanistan. See Dogs (table).

Afghanistan. Mountainous inland country of Asia; area, 250,000 sq. m.; pop. 11,500,000; cap. Kabul, 1-46, with map; flag, 3-385 illus. f., stamp, 7-143 illus.

Afghan War (1878-80). Robert-march to Kandahar, 1-47, 6-414.

Africa. Continent; area 11,699,000 sq. m.; pop. 198,000,000, of whom about 40,000,000 are white, 1-49, maps f. 1-55, 63; animals, 1-56, 3-109, 3-225, 4-357, 7-35; climate, map f. 1-53; products, 1-55, minerals, 7-58; population and peoples, 1-50; and history and

TERMS COMMONLY USED IN AERONAUTICS

Aerobatics Manoeuvres performed voluntarily other than those used in normal flight (e.g. looping the loop)

Aerodynamics Branch of physics dealing with forces that act on bodies moving through the air. See Streamlining

Aerofoil Any aircraft structure such as a wing or rudder which acts against the air to provide lift or to help control

Aileron A hinged flap on the trailing edge of a wing. It can be tilted by the pilot to force the wing up or down

Airframe An aircraft without its engine

Air Pocket Vacuum in the air on an aircraft's direction of flight. It results in reduced lift under the aircraft wings

Airscrew A propeller

Air speed Speed of an aircraft relative to the air through which it is flying, as distinguished from its speed relative to the ground

Altimeter Instrument registering approximate height above sea level

Altitude Height at which an aircraft is flying above sea level

Amphibian Aircraft that can take off from or alight on land or water. It has retractable wheels on the hull

Aspect Ratio Ratio between the wing span of an aircraft from wing tip to wing tip and the chord of one wing

Athodyd Abbreviation of athodyd, aerodynamic duct, a form of jet engine that does not have a turbine compressor or other moving parts (commonly called a ramjet (which see))

Attack Angle The angle between the line along which an aircraft points and the line of its motion, that is the angle between a wing chord and the counter thrust of the supporting air

Autogiro Aircraft having a freely rotating wing and driven by a propeller

Automatic Pilot Gyroscopic compass linked to the controls of an aircraft. It will keep the aircraft on course without attention by the pilot

Banking Tilting an aircraft inwards at an angle to assist turning action of rudder

Biplane Aircraft with two wings, one above the other

Blackout Loss of consciousness while making a fast turn or when pulling out of a dive. Caused by centrifugal force draining blood from the brain

Blind flying Navigating in aircraft by instrument indication when visibility prevents outside observation

Camber The curved surface of a wing between the leading and trailing edges

Ceiling Maximum altitude an aircraft can reach. Service ceiling is the altitude to which an aircraft can climb at a specified rate of feet per second

Chord The distance between the leading and trailing edges of a wing

Cockpit That part of an aircraft from which it is controlled in flight

Contact Warning from pilot to mechanic that engine ignition is turned on preparatory to take-off

Crabbing Sideways drift of an aircraft in flight or when landing

Cross-wind landing Landing not in line with direction of wind over runway

Cruising speed The speed at which an aircraft flies most economically

De-icer Chemical or mechanical device that prevents formation of ice on wings, propeller, or control surfaces

Delta wing Aircraft wing in the form of a triangle so called from the Greek letter Δ (delta)

Dihedral The angle between the horizontal surface of a wing and the fuselage

Drag Resistance an aircraft has to overcome in forward motion through the air

Elevator Hinged horizontal structure on an aircraft's tail assembly, used to govern upward and downward direction of flight

Endurance The time an aircraft can maintain flight without refuelling

Fairing Streamlined cowl placed over any irregularly shaped projecting surface likely to offer increased resistance to forward movement

Feathered propeller Type of propeller having blades that can be turned edge forward so that they will not revolve when the aircraft moves through the air with engine stopped

Fin Fixed surface on tail assembly to maintain flight stability

Flaps Hinged surfaces on the trailing edge of a wing, lowered to increase air resistance and act as a landing brake

Floater Undercarriage of a seaplane

Flying Boat Aircraft with a boat-like hull for alighting on water

Fuselage The body of an aeroplane to which wings and tail assembly are joined

"g" The load or pull imposed upon a pilot or his aircraft by centrifugal force during a turn. The strength of "g" is measured by comparing it with the force of gravity which is defined as one "g"

Gliding Angle Slanting direction of an aircraft landing with engines off

Gliding ratio Maximum distance a gliding aircraft can reach in relation to its altitude

Gravity Centre of that point of an aircraft fuselage where the aircraft would balance without tipping backward or forward if mounted across a fulcrum

Helicopter Aircraft with overhead power driven horizontal rotors. It can rise or descend vertically

Icing Ice deposited on an aircraft surface, particularly wings

Impeller The rotating part of a turbo-jet engine

Incidence Angle Angle between the chord of a wing and the horizontal centre of the aircraft

Interference The reducing of an aircraft wing efficiency by the proximity of another surface. This causes air eddies and induces drag

Jet Stream of high pressure gas issuing from the rear of a rocket, athodyd, or turbo-jet engine. The reaction of the jet drives the aircraft forward in motion

Joystick A rigid lever with which the pilot controls flight direction

Leading edge Front edge of an aircraft wing or other surface

Lift The support given by the air to an aircraft in flight. The degree of lift is governed by the shape and surface area of the wing, the speed of the aircraft and the angle of attack (see Attack Angle)

Longeron Main spar or girder around which an aircraft fuselage is built

Loop, looping the A complete vertical turn made in the air

Mach No. Ratio of an aircraft's speed to the speed of sound under the same atmospheric conditions

Monoplane Aircraft with a single plane of wing

Nacelle Housing for engine or crew built out on a wing

Payload That part of the total weight of an aircraft accounted for by crew, passengers and freight

Pitch The angle of an airscrew blade in relation to the airflow in which it is turning. A variable-pitch airscrew can be adjusted to give water propeller bite with the airflow

Pitot Tube Tube with an open end forward mounted on nose or leading edge of wing. It gathers air during the forward movement of the aircraft and is connected to a meter which registers flying speed

Power Dive Downward flight of an aircraft with engines at full power

Propulsive Efficiency The maximum propulsive power developed by an aircraft engine in flight

Pressurised Aircraft cabin that maintains its interior air pressure at approximately the atmospheric pressure of air at ground level

Pulse Jet Type of reaction (jet) engine in which the jet issues intermittently

Pusher Aircraft with the airscrew mounted at the rear

Radial Aircraft engine with its cylinders arranged in a circle around the crank shaft

Radius The maximum theoretical back distance an aircraft can fly without refuelling

Range The direct distance an aircraft can fly on one load of fuel

Ramjet Reaction (jet) engine in which air is rammed or forced into the combustion chamber by the forward motion of the aircraft

Reduction Gear Gearing between a turbo-jet or a piston engine and the airscrew. It causes the airscrew to run more slowly than the engine

Rib Internal support of a wing running from trailing to leading edges

Roll Rotation of a plane around its axis so that it turns over on its back and comes upright again

Seaplane Aircraft fitted with floats so that it can take off from or alight on water

Sideslip Sideways and downwards movement of an aircraft when it is held on a straight course with wings tipped

Slipstream Body of air thrown back by an airscrew

Slots Device on the leading edge of a wing to delay stalling of an aircraft

Sound Barrier Point when aircraft speed equals that of the speed of sound at the aircraft's altitude

Span Length of an aircraft wing from tip to tip

Spar Chief structural support of an aircraft's wing from root to tip

Spin Rapid sideways fall of an aircraft nose first down a steep corker's path. It is caused by loss of lift resulting from a stall. See Stalling

Spinner Streamlined turbine (see Fairing) fitted to the front of and revolving with a propeller's hub

Stabiliser Fixed horizontal or vertical fin in the tail of an aircraft to hold it in normal flying position

Stability Property of an aircraft to maintain straight and level flight

Stalling All wing on aircraft incline to lose power so that forward motion is lost

Stratosphere Region of space above the earth's atmosphere

Streamlining Aerodynamically shaping an aircraft's wings and fuselage to reduce the minimum resistance to the air

Supersonic Speed Aircraft speed exceeding that of sound

Swept Wing Aircraft on which the leading edge of the wing tapers, or is swept back to the rear

Strut Any structural part of an aircraft that holds other parts in place

Supercharger Device for supplying an aircraft engine with air at more than atmospheric pressure

Taxiing Moving an aircraft along the ground under its own power

Three-point landing Landing an aircraft so that all landing wheels make simultaneous contact with the ground

Thrust The power developed by the reaction of a jet engine. Measured in thrust horse power

Torque Twisting force that tends to make an aeroplane roll. Caused by the gyroscopic effect of rotating engine parts

Transonic Speed Aircraft speed in excess of the speed of sound

Turbo-jet Form of jet engine which uses a turbine-driven compressor to increase the thrust of the jet

Turbo-prop Turbo-jet engine driving an airscrew

Trim tab An adjustable part on a control surface to modify aircraft stability

Underside Wheeled landing gear on an aircraft

Wing Loading Wing area of an aircraft in square feet divided by the total laden weight of the aircraft in pounds. This gives the total weight that safely can be lifted for a wing of given area

AFRICAN ELEPHANT

discovery, 1-52; Livingstone's explorations, 4-527; European influences, 1-55; in Second World War, 7-489-493; travel and communications, 1-85; primitive money, 5-834 illus.; witch doctor, 5-80 illus.; Abyssinia, 3-298; Angola, 1-55; Congo States, 2-481; Egypt, 2-172; Gold Coast, 4-41; Liberia, 4-455; Libya, 4-458; Madagascar, 6-64; Mozambique, 6-268; Nigeria, 5-435; Orange Free State, 6-524; Rhodesia, 6-394; Somaliland, 7-84; South Africa, 7-89; Zambesi, 7-521.

African elephant. Ivory from tusks, 4-331.

African languages, as group, 6-158.

African marigold. Flower, native of Mexico, 6-136.

African viper. Snake; skeleton of, 7-74 illus.

Africa Star. Brit. award of Second World War, Instit. Aug. 1943, for service in N. Africa, Abyssinia, Malta and the Mediterranean; with clasp for 8th and 1st army.

Afridi. Pathan tribe on Pakistan-Afghan frontier. Tall, lean, light-skinned, and of Persian stock, they number eight clans. They are Sunni Muslims and speak N. Pushtu.

Afrikaans. S. African language, 1-66.

Afrika Corps. Ger. mechanised armoured force of 2nd World War, trained to fight in N. Africa; and F.M. Alexander, 1-100.

Afrikaans. S. African people; language, 1-66.

Agadir. Spt. in French Protectorate of Morocco; said to have been important trading centre in Roman era; was closed to commerce for 165 years; reopened 1930.

Aga Khan III (ahgalkahn') (Aga Sultan Sir Mohammed Shah) (b. 1877). Mahomedan leader of vast influence which he exerted to raise Indian standards and to encourage co-operation with British; a famous racehorse owner; Derby wins, 3-76.

Agamemnon. King of Myc. nae, leader of Greeks against Troy, 1-66; and Achilles, 1-10, 7-320; in Aeschylus, 1-45.

Agar-agar. Gelatinous substance obtained from certain seaweeds; 1-105; properties, 2-455.

Agartala. Cap. of Tripura state, Rep. of India, 4-241.

Agassiz, Jean Louis Rodolphe (ag assé) (1807-73). Swiss zoologist, 1-67.

Agate. A coloured variety of quartz, used as a semi-precious stone, 6-320; 7-55, 7-166.

Agatha, St. Patron saint of Malta; a noble Sicilian woman who was martyred about A.D. 251. Canonised by Pope Gregory I.

Agave. Plants of the family Amaryllidaceae; several species, 1-67; products from, 8-138; aial, 7-58.

Agave sisalana. See Sisal hemp.

Agency. In commerce, advertising agency, 1-22.

Agaul. R. of Rumania, rises in Transylvanian Alps and flows about 185 m. to Danube, 6-470.

Agglutinative languages, 4-445.

Agheila (ag'hlah), El. Village of Cyrenaica, 100 m. s. of Benghazi; changed hands three times during 1941-42; limit of Wavell's advance from Egypt, 7-489, 490; taken by Montgomery 1942, 7-493.

Agincourt. Village in N. France; scene of decisive battle in Hundred Years' War (1415), 1-68, 4-204, 4-163.

Agila (ag'lah'ya). In Gk. myth., one of the three Graces.

Agnes, St. Virgin martyr (d. 306), patron of girls; symbol, a lamb.

Agouti. A nocturnal plant-eating rodent, 1-68.

Agri. Cap. of Uttar Pradesh, India; pop. 284,000, 1-68.

Agvald. See Zagrbl.

Agvald. Sir. Knight in Arthurian legends, 8-458.

Agriicola, Georgius (1490-1555). Ger. mineralogist, author of *De Metallica*, first scientific textbook on mining and metallurgy; 5-216 illus.

Agriicola, Gnaeus Julius (37-93). Rom. general and gov. of Britain, 1-69, 2-73, 74.

Agriculture. 1-70; development of plants, 8-219; bacteria and plants, 1-344; and botany, 2-25; primitive agriculture, 5-109, 2-408, 7-164 illus.; development of plough, 6-223; as basis of medieval life, 5-300; in anc. Egypt, 3-194 illus.; in China, 2-369; in prairie land, 5-114 with illus.; frosts, 3-478; potato crop, 6-273; poultry breeding, 6-277; collectivisation, 6-476; world food supply, 3-412; best soil for, 7-83; for careers in, 2-236.

Agriculture, Fisheries, and Food, Ministry of. Govt. dept. dealing with agriculture, etc., in Eng. and Wales.

Agrippa, Marcus Vipsanius (63-12 B.C.). Rom. statesman and general, friend of emperor Augustus; at battle of Actium (31 B.C.), 1-309.

Agrippina (agrip'pina) (A.D. c. 15-59). Rom. empress, wife of Claudius and mother of Nero, 5-367.

Ague. Old name for malaria in England, 5-61.

Aguilas (ahg'wah'ya), Cape, southernmost point of Africa, 1-49.

Ahab. King of Israel, 875-853 B.C.; married Jezebel; rebuked by Elijah for permitting idolatry (1 Kings xvi-xxii).

Ahasuerus (ahhas'uerus), anc. king of Persia identified with Xerxes the Great.

Ahasuerus, the legendary Wandering Jew. 7-418.

Ahmedabad. Tn. in Bombay state, India; pop. 591,267; silk and cotton mfrs., 1-515.

Ahmed Fuad II (b. 1932). Son of Fatouk, King of Egypt; named successor on latter's abdication, 3-180.

Ahmed Khan, Sir Syed (1817-98). Indian nationalist; and Muslims in India, 6-40.

Ahmed Zogu. President of Albania 1925, became king 1928. See Zog.

Ahriman. Spirit of evil in Zoroaster's doctrine, 7-527.

Ahuachapán. Tn. in El Salvador, 1925, became king 1928. See Zog.

Ahura Mazda. Spirit of good in Zoroaster's doctrine, 7-527; as father of fire, 3-356.

Aida. Opera by Verdi; scene laid in anc. Egypt; story, 5-516.

Aidan, St. (d. 651). From 635 first bishop of Lindisfarne, he converted Northumbria, 3-276, 5-461.

Aigrette. Name for certain species (egrets) of the heron family, also for their long plumes assumed in the nesting season, 7-168 and illus.

Allanthus (alan'thus), a genus of trees including the tree of heaven, commonly seen in suburban gardens; leaves resemble those of ash, but are much larger; valuable for feeding silkworms.

Allerton, in aeroplane. 1-39, 40, with diag.

Allort, Loch. Sea loch, Inverness shire, Scot. 4-275.

Alisa Craig. Rocky islet in the Firth of Clyde, Scot., 1,140 ft. high, 1-79.

Ain, riv. tributary of the Rhone; rises in Jura Mts., and flows s.w. 119 m. to the Rhone, 6-396.

Ainsley, Henry (1879-1945). British actor; famous in Shakespearean roles.

Aino (i'nō) or Ainu ("man"), an aboriginal race found in northern Is. of Japan, more European than Mongolian in type.

Ainsworth, William Harrison (1805-82). Eng. historical novelist and magazine editor; wrote 39 novels, chiefly historical; best known are *The Tower of London* (1840) and *Old St. Paul's* (1841), 6-487.

Aintree. Suburb of Liverpool, famous for its racecourse; Grand National, 4-199, 4-525.

Ainu. See Aino.

Air, 1-79; composition of, 1-79; compression and diesel principle, 3-83; resistance and pressure in flying, 1-31, 53, 6-72; and streamlining, 7-173;

in the stratosphere, 7-172; friction caused by, 3-470; air conditioning, 1-82; supply in diving suit, 2-95; as energy in pneumatic machines, 6-230; atmospheric pressure, 5-178; dew formation, 3-82; evaporation, 3-319; respiration, 5-52; nitrogen in, 5-443; See also Air Conditioning.

Air Base. Organization in Queensland, Australia, for flying carcasses of meat to ports, 6-321.

Airborne Forces. Troops specially trained and equipped to be transported by air to the battlefield. Included are parachute troops and glider-borne forces; at Arrhem, 1-253, 7-405.

Air brush, pneumatic power in. 6-231.

Air chief marshal. in R.A.F., 6-463.

Air commodore. in R.A.F., 6-463.

Air conditioning. 1-82.

Aircraft. in the stratosphere, 7-172; torpedoes carried by, 7-293 illus. See also Aeroplane; Airship; Balloon.

Aircraft carrier. Warship in which numerous aircraft are carried, and having a deck for the taking off and landing of aircraft, 5-342, 343, 346 illus.; in battle of the Atlantic, 1-294.

Aircrow, careers in R.A.F., 6-462.

Aird, Sir John, Bart. (1833-1911). Brit. engineering contractor; built the Aswan Dam on R. Nile.

Airdrie. Mfg. tn. in Lanarkshire, Scot.; pop. 30,308; engineering, iron and brass works; cotton and silk industries, 4-441.

Aire, r. of Yorks, Eng., 71 m. long. connects Leeds with E. coast, 4-475.

Airedale terrier. Eng. sporting dog, 3-103, 3-100 illus. f. See also Dogs (table).

Airfield. See Aerodrome.

Air Force. See Royal Air Force.

Air Force Cross (A.F.C.). Decoration instituted 1918 for officers in R.A.F. for courage or devotion to duty when flying, but not against enemy.

Air Force Medal. (A.F.M.) Similar decoration (1918) for warrant and N.C.O.s and men of R.A.F.

Air-gun. Gun fired by compressed air; as pneumatic machine, 6-231.

Air-lift (of Berlin). See Berlin.

Air mail. Services, 6-272; in history of air transport, 1-85.

Air marshal. in R.A.F., 6-463.

Air Ministry. Brit. govt. dept. responsible for the Royal Air Force and the military side of Brit. aviation. Formed 1918.

Airports; air transport problems, 1-86.

Air pressure, and barometer, 1-370, 371.

Air Raids. See World Wars; and individual towns, etc., such as London.

Air records, 1-42; polar flights, 6-245.

Amy Johnson, 4-379; Douglas Skyrocket, 6-424; See also Air Records (table).

Air Scouts. Branch of the Boy Scout movement; training, 2-35 illus.

Aircrow. Correct name for aeroplane propeller.

Airship. 1-83; helium as gas in, 4-160; explosion of the *Hindenburg*, 4-221.

Air Training Corps (A.T.C.). Brit. voluntary organization estab. Feb. 1941 to provide training for prospective candidates in the R.A.F. or Naval Aviation. In 1946 reorganized under Reserve Command in six Regional Groups, 2-159, 6-463.

Air Transport. 1-85; converted military aeroplane, 1-41; and international law, 4-459; Atlantic services, 1-292; Arctic route, 1-222; in Africa, 1-66.

Air Transport and Travel. Pioneer British aviation company; foundation (1919), 1-85.

Air vice-marshal. in R.A.F., 6-463.

Airy, Sir George Biddell (1801-92). Brit. astronomer; originator of photographic record of sun spots.

Airy's transit circle. Instrument for checking sidereal time, 7-279 illus.

Aisne, r. in N. France (175 m.); famous battleground in 1st World War 7-478.

Ait (Island). See Eyes.

AIX

Aix (-su-Provence), France. Historic town, former cap. of Provence; pop. 38,300; founded 123 B.C.; hot springs; univ. (established 1409).
Aix-la-Chapelle. Fr. name for Ger. tn. of Aachen; treaty of, 1-326, 5-125.
Ajaccio. Cap. of Corsica; pop. 31,134; birthplace of Napoleon, 2-512.
Ajanta. Village of Hyderabad, India, noted for cave dwellings dating back to 300 B.C.; cave temples, 2-281, 4-249.
Ajax (the Great). Son of Telamon and Gk. hero in the Trojan war, 1-87.
Ajax (the Lesser). Gk. hero of the Trojan war, son of Oileus, 1-47.
Ajmer. State of Rep. of India; area 2,425 sq. m.; pop. 692,506; cap. Ajmer city, 4-241.
Ajmer. City, cap. of Ajmer state, Rep. of India, pop. 150,000, 4-241.
Ajmer-Merwara. Former prov. of Brit. India, renamed Ajmer, 4-239.
Ajusco Mts., Mexico; volcanic chain forming part of s. wall of cent. plateau, 5-189.
Akaba (ak'abah). Tn. of Jordan on E. side of Gulf of Akaba, an arm of Red Sea; near boundaries of Israel and Egypt.
Akbar (1542-1605). Greatest of the Mogul emperors in India; grandson of Babar the Mogul; reigned from the age of 14; rule, 5-238, 239 illus.; and Agra, 1-69; conquest of Hindustan, 4-251; and Bengal, 1-428; hunting scene, 4-248 illus.
A Kempis, Thomas (c. 1379-1471). Ger. monk, author of *The Imitation of Christ*, 1-87.
Akenside, Mark (1732-1771). Brit. physician and poet; wrote *Pleasures of Imagination*.
Akhnaton (reigned c. 1367-1350 B.C.). Egyptian king of the XVIIIth dynasty. Began his reign as Amenhotep IV, but changed his name when he introduced worship of the sun god Aton; El Amarna correspondence, 1-205, 3 199.

Akka. Tribe of pygmy people in the Belgian Congo, 6-312.
Akkadians. A Semitic people who conquered the Sumerians in Mesopotamia, 5-176.
Akron. Tn. in Ohio, U.S.A.; pop. 271,605; known as "rubber capital" of the world, 5-506.
Akron. U.S. airship; built 1931, 1-84 illus.
Akureyri. Tn. in Iceland; pop. 7,017, 4-233.
Akyab. Island and spt. of Arakan, Burma; the spt. is on E. side of the island; rice mill; exports rice, oil, timber; pop. 36,569. On May 8, 1912, taken by Japs; chief Jap. base for air raids on Calcutta, 1912 43; evacuated by Japs. during 1914; re-occupied by Allies Jan. 1945.
Alabama. Southern state of the U.S.A.; cap. Montgomery; area 52,000 sq. m.; pop. 3,061,743, 1-87.
Alabamine (element). See *Astatine*.
Alabaster. A variety of gypsum, 4-112.
Aladdin. Story from Arabian Nights, 1-197.
Alagoas. State in N.E. Brazil; pop. 1,106,454; area 22,577 sq. m.; cap. Maceio.
Alais, Peace of (1629), and end of civil wars in Fr., 4-202.
Alameda, California, U.S.A.; pop. 64,430; ships, motors; petroleum and borax-refining plants.
Alamein. Battle fought Oct.-Nov. 1942, in Egypt, between the Germans and Italians and British Commonwealth forces, 1-87, 5-253, 7-492.
Alamanni. See *Alemanni*.
Alamogordo. Air base in Los Alamos desert, New Mexico; first atomic explosion, 1-303, 5-400.
Alanbrooke, Alan Francis Brooke, 1st Viscount (b. 1883). Brit. soldier; C.-in-C. Home Forces, 1940-41; C.I.G.S., 1941-46; Constable of Tower of London since 1950.
Åland Islands. Archipelago at entrance to Gulf of Bothnia, 6,854 islands;

strategic importance. Ceded to Russia by Sweden (1809), awarded by League of Nations to Finland (1921). Fortification, forbidden by Convention of 1921, and by the Allied-*Finland* peace treaty of 1947.
Alarodon (tshahrkōn'), Pedro Antonio de (1833-91). Span. novelist, 7-122.
Alarodon y Mendoza (tshahrkōn' 6 msho-dē'tshah), Juan Ruiz de (c. 1580-1639). Span. dramatist, 7-122.
Alario I (376-410). King of Goths; ravaged Italy and sacked Rome in 410, 4-49; ransom in pepper, 6-121.
Alaska, a territory of the U.S.A.; area 586,400 sq. m.; pop. 128,643; 1-88; ice-sheet formation, 4-25; brown bear, 1-392.
Alaska Highway, constructed 1942, to carry war materials from U.S.A. to Alaska, via Edmonton, Ft. Nelson, Whitehorse, to Fairbanks (Alaska); total length, 1,671 m., 1-91; 2-203.
Alaska Range. Mts. of Alaska on Pacific coast; highest point Mt. McKinley (20,464 ft.), 1-88; map, 1-90; 5-452.
Alasio. It. resort in prov. of Liguria, 6-403.
Alas'tor. In Gk. myth., the spirit of revenge personified; or a man driven by such a spirit. Title of a poem by Shelley.
Alba, Duke of. See *Alva*.
Albacore (al'bakawr), a fish of the tunny family.
Alba Longa. It. city of anc. Latium, founded, according to tradition, by Ascanius, son of Aeneas; birthplace of Romulus and Remus; destroyed by Rome, 6-129.
Alban, St. (d. about 305). Traditionally the first British martyr; festival June 22 (in C. of E. Calendar, June 17), 1 91.
Albani, Dame Emma Marie (1852-1930). Canadian soprano singer.
Albania. Country of Europe; area 10,629 sq. m.; pop. 1,150,000; cap. Tirana; 1-91; people, 1 350; Italian

ALBANIA

AIR RECORDS AND ACHIEVEMENTS

1903. Dec 17, at Kitty Hawk, North Carolina, U.S.A., Orville Wright flies first man-carrying aeroplane to leave the ground.
 1906. August 22, Alberto Santos-Dumont makes first aeroplane flight in Europe.
 1909. Feb 27, J. T. C. Moore-Brabazon makes first officially observed aeroplane flight in England. June 8, world's first aeroplane exhibition opened in Paris; July 25, Louis Blériot of France makes first air crossing of English Channel.
 1910. April 28, Claude Grahame-White makes first night flight; May 10, first air display at Hendon, London; June 2, C. S. Rolls flies English Channel in both directions.
 1911. July 11, J. Beaumont completes circuit of British Isles. Sept. 9, British Post Office establishes world's first air mail service by flying letters between Hendon, Middlesex, and Windsor, Berkshire.
 1912. Sept. 9, J. Vedrines sets up speed record of 107 m.p.h., first pilot to fly at 100 m.p.h.
 1913. Sept. 6, Adolph Pigoud, first pilot to loop the loop.
 1914. June 6, first out-of-sight-of-land flight, Scotland to Norway.
 1919. June 14, J. Alcock and J. W. Brown make first non-stop trans-Atlantic flight (Newfoundland to Ireland). Aug. 26, first commercial London-Paris air service begins. Nov. 12-Dec. 10, E. Smith and K. Smith make first flight to Australia.
 1920. Feb. 4-March 30, first England-South Africa flight.
 1924. April 1, Imperial Airways formed. April 7-Sept. 28, first round the world flight, Seattle-Japan-India-Europe-Iceland-Seattle, by U.S. aircraft.

1926. March 1-May 27, four R.A.F. Fairey bombers make first long-distance formation flight (Cairo-Cape-town and back). Dec. 28, Imperial Airways begins passenger and mail service to India.
 1927. May 20 21, Charles Lindbergh makes first solo flight from New York to Paris. Sept 26, Britain wins Schneider Trophy at Venice at a speed of 281.7 m.p.h.
 1928. Feb. 7-22, Bert Hinkler makes first solo flight from England to Australia.
 1929. April 24-26, first non-stop flight from England to India (Cranwell, Lincs. to Karachi). Sept. 7, Britain retains Schneider Trophy with a speed of 328.6 m.p.h.
 1930. May 5-24, Amy Johnson makes first solo flight by a woman from England to Australia Oct 9-19, C. E. Kingsford-Smith makes record England-Australia flight (11 days).
 1931. Sept. 13, Britain wins Schneider Trophy outright at speed of 340 m.p.h.
 1932. Jan. 19, Imperial Airways begins Britain-South Africa air mail service. Aug. 18-19, J. A. Mollison makes first solo east-west trans-Atlantic flight.
 1933. Feb. 6-8, O. R. Gayford and G. R. Nickollette set up non-stop distance record of 5,541 miles (Cranwell, England, to Walvis Bay, S.W. Africa). April 13, Lord Clydesdale flies over summit of Mt. Everest.
 1934. Sept. 21, Imperial Airways begins England-Australia air mail service. Oct. 22-Nov. 4, Charles Kingsford-Smith and A. Taylor make first Australia-U.S.A. flight across Pacific. Oct. 23, C. W. A. Scott and T. C. Black win MacRobertson England-Australia air race in 71 hours 18 sec.

1936. April 20, Imperial Airways begins trans-Africa air mail service (Khartoum-Lagos). Sept. 29, F. R. D. Swan sets up world altitude record of 49,967 feet Oct 5 16, Jean Batten makes first direct England-New Zealand flight.
 1939. July 5, Imperial Airways begins trans-Atlantic mail and passenger service (Fovnes, Ireland, to Botwood, Newfoundland) Dec 2, Imperial Airways and British Airways amalgamated to form British Overseas Airways Corporation.
 1941. April 7, first flight of a turbo-jet aircraft, Gloster-Whittle E28/39.
 1945. Nov. 17, H. J. Wilson sets up new world speed record of 606 m.p.h. in R.A.F. jet Meteor.
 1946. May 31, London Airport officially opened to international traffic.
 1948. March 21 John Cunningham establishes world altitude record of 59,492 feet.
 1951. Aug. 31, English Electric Canberra jet bomber crosses Atlantic (Aldergrove, Ireland, to Gandar, Newfoundland) in 4 hours 19 minutes.
 1952. Aug. 26, double crossing of Atlantic (Belfast to Newfoundland) in one day by Canberra jet bomber; west to east crossing made in 3 hr. 25 min. at average speed of 605.52 m.p.h.; average for whole trip 411.90 m.p.h.
 1953. Oct. 29, Lt.-Col. F. K. Everest flying Super Sabre Jet establishes world speed record of 755-149 m.p.h.
 1955. Aug. 23, Canberra PR7 flies from London (Croydon) to New York and back in 14 hr. 21 min. 45.4 sec. at average speed of 481.52 m.p.h. Aug. 29, Canberra establishes world altitude record of 65,876 ft.
 1956. March 10, Peter Twiss, in Fairey Delta II, achieves world speed record of 1,132 m.p.h.

ALBANY

annexation. 3 318, 5-311, 7-480; flag, 3-84 illus. f.

Albany, New York, U.S.A. Cap. and 2nd oldest city of state; pop. 134,005, 5-421.

Albany, spt. tn. of W. Australia, on arm of King George Sound; pop. 6,300, 7-441 illus.

Albatross. Sea-bird related to the petrels, 1-92; 1-169.

Albay, Tn. on Luzon, Philippine Is., renamed Legaspi.

Albert I (1875-1934). King of the Belgians, 1-418.

Albert, Prince Consort (1819-61). Husband of Queen Victoria, 1-92, 7-399 with illus. f.; art-collecting, 2-454.

Alberta. Prov. of w. Canada; area 255,285 sq. m.; pop. 939,501; cap. Edmonton, 1-93; natural gas reserves, 6-331; Redwater oilfield, 6-150 illus.

Albert Canal, Belgium. Nearly 79 m. long, connecting Lake and Antwerp, 1-421, 1-195.

Albert Hall, Royal. Concert and meeting hall in Kensington, London, built in 1871 in memory of the Prince Consort, has one of the largest organs in the world, 6-1 illus.; can seat 8,000.

Albert Medal. Decoration instituted by Queen Victoria in 1866. It is open to all and is awarded for acts of gallantry in saving life at sea or on land.

Albert Memorial. Monument in Kensington Gardens, London, in memory of the Prince Consort; designed by Sir Gilbert Scott.

Albert Nyanza. Lake in cent. Africa, one of chief sources of Nile; discovery, 1-348, 5-440.

Albertus Magnus (c. 1200-1280). Medieval scientist, philosopher and theologian; developed the sciences of botany, astronomy, mineralogy, and physical geography; writings on flight, 1-27.

Albigenses [albi'genz], heretical sect prominent in early 13th cent., named from Albi, France, their cap.

Albino. A person or animal whose skin, hair and eyes lack colouring matter; birds, 1-170; peacock, 6-101 illus. f.; sacred white elephants, 7-16.

Albion. Anc. name of Britain; lit. "white land" (from Latin *albus*) referring to chalk cliffs of s. coast.

Albret, Charlotte d', princess of Navarre, marriage to Cesare Borgia (1199) 2-17.

Albret, Jeanne d' (1528-72). Huguenot queen of Navarre, mother of Henry IV of Fr., 4-161.

Albuera, battle of (1811). In Peninsular War; fought May 16 at village 13 m. s.e. of Badajoz between Eng., Spanish and Portuguese under Gen. Bessford, and Fr. under Soult; a costly victory for the Allies.

Albumin. Any protein resembling albumen in properties.

Albuquerque [albi'kür'kå], Alfonso d' (1453-1515). "the Great." Conqueror of Goa, and founder of Port. power in E. Indies.

Albuquerque. Largest tn. in New Mexico, U.S.A., pop. 97,012, 5-100.

Alca impennis. See Great Auk.

Alcalá de Henares [alikalah da onah'res], old town in Spain near Madrid; pop. 11,700; birthplace of Cervantes.

Alcan Highway. See Alaska Highway.

Alcantara [alikaln'tahrah], Spain. Anc. tn. on Tagus; owes name (Arabic "bridge") to Rom. bridge built by Trajan; about 1215 became a stronghold of knightly Order of Alcantara, organized for defence against Moors; Roman bridge, 6-446, illus.

Alcázar. Moorish fortress-palace in Seville, Spain, 7-5.

Alcestis. In Gk. myth., wife of King Admetus, whom she saves by dying in his stead.

Alcho ny. Earliest form of chemistry, 1-94.

Alcidades [alsbladéz] (c. 450-404 B.C.). Brilliant Athenian general and statesman, nephew of Pericles; pupil of Socrates, 7-32.

Alcmaeonidae. Famous and powerful family in anc. Athens, claiming descent from Alcmaeon, great-grandson of Nestor, Pericles, 6-125.

Alcmene, mother of Hercules, 4-165.

Alcock, Sir John (1892-1919). Brit. airman; first pilot to make a non-stop transatlantic flight (1919).

Alcohol. 1-98, digestion of, 3-90; distillation, 3-94; proof spirit, 7-137; alcoholic liquors 7-137; prohibition, 6-42; in thermometers, 7-207, and voc. 1, 7-512.

Alcoholic Liquors, 7-136-37, 461.

Alcott, Louisa May (1832-88). Amer. writer, 1-97, 2-358, 7-365.

Alcove. See Architectural Terms.

Alcuin (735-801), Eng. scholar and churchman, head of Charlemagne's palace school, 2-306.

Aleyone or Halcyone. In Gk. myth., daughter of Aeolus; name gave origin to phrase halcyon days, supposed calm weather about breeding season of the halcyon (kingfisher). Aleyone and Cox, her husband, were changed into birds.

Aldabra [aldah'brah]. Group of small is. in Indian Ocean, part of Brit. colony of Seychelles.

Aldbaran [aldah'aran], star of first magnitude, 7-14.

Aldbrough [awld'bre], coast tn. in Suffolk; birthplace of Crabbe; pop. 2,480, 7-182.

Alden, John (1599-1687). Mayflower pilgrim; immortalized in Longfellow's poem, "The Courtship of Miles Standish."

Alder. Deciduous tree, also known as Scots mahogany, 1-97.

Alder fly. Species of large, net-veined insect peculiar to Amer.; larvae (dobson) used as bait for still-fishing; eggs, 3-171 diag.

Alderney. One of the Channel Islands; area 3 sq. m.; pop. 1,321; 2-302.

Aldershot. Tn. and Army camp in Hants, Eng.; pop. 36,184; 4-123.

Aldhelm, St. (c. 640-709). Abbot of Malmesbury and first Bishop of Sherborne.

Aldis signal lamp. Method of signalling in Morse by reflective electric light 7-52.

Aldus Manutius (1440-1515). Famous Venetian printer, 1-97; and punctuation, 6-309.

Aldwych [awld'wich]. Curved London thoroughfare, opened in 1905, enforcing street and at eastern end near St. Clement Danes. It is a one-way street for east-bound traffic. Island between Aldwych and Strand occupied by Australia House and Bush House.

Ale, fermentation, 1-96.

Alekhine, Alexander (1892-1946). Russian chess player. Chess champion of the world, 1927-35, championship regained 1937-40, 2-328.

Alemán, Mateo [al'mahn'] (c. 1517-c. 1611), Spanish novelist, who wrote first picaresque novel, 7-122.

Alemán, Miguel (b. 1902). President of Mexico; elected Dec. 1916.

Alemanni [al'mann'] or **Alamanni** ("all-mon"), confederacy of Ger. tribes; conquered in 195 by Clovis; name Allemagne applied by French to modern Germany; migrations, 5-201.

Alembert [al'mbär'], Jean le Rond d' (1717-83). Fr. mathematician and philosopher, associated with Diderot on the *Encyclopédie*.

Alemtejo [al'mhnt'zho], province of S. Portugal, famous for cork industry; 9,200 sq. m.; pop. 669,700.

Alençon [al'on-sawn]. Tn. of France; pop. 16,600; linen and woollen goods; lace manufactures ("point d'Alençon"), 4-432.

Alep'po (Arabic *Halab*), metropolis of S. Syria; pop. 382,541; for centuries centre of caravan trade between Baghdad and Damascus, 7-217, 218 illus.

Alessandria [al'hesan'driah]. It. fortified city in Piedmont; pop. 79,300; rly. centre; textiles.

ALEXANDRA

Aletschhorn (ah'lechhorn), a peak (13,723 ft.) in the Swiss Alps; the Aletsch glacier, 16 m. long, is the largest in the Alps.

Aleurone cells, in wheat grain, 3-391.

Aleutian Islands. Chain of small is. between the Bering Sea and Pacific Ocean, extending from Alaska towards Asia; 80 in number, 1-90, with map.

Aleuts. People of the Aleutian Islands and N. side of Alaskan peninsula; allied to Eskimos, 1-90.

Alevin. Name given to salmon fry; early life, 6-189.

Alewite, or gaspereau, a shad-like fish found in N. America.

Alexander III (1159-81). Pope; and Henry II, 1-402.

Alexander VI (1431-1503). Pope (Rodrigo Borgia), 2-17; and the Papal line, 1-132; and Savonarola, 6-301.

Alexander (1893-1920). King of the Hellenes, succeeded in 1917.

Alexander (the Great, 356-323 B.C.). King of Macedonia, and one of history's greatest conquerors, 1-98; invasion of India, 6-310, 4-251; conquest of Persia, 6-131; founds Alexandria, 1-50, 3-200; in Greece, 4-77; and Aristotle, 1-228; Bucephalus, 2-102; Diogenes and, 3-91; influence on Indian art, 4-249; coins, 5-235; and beards, 1-397; and ice-cream, 4-230; cameo portrait, 2-189, illus.; death in Babylon, 5-176.

Alexander I (1777-1825). Tsar of Russia; at first allied with Brit., Austria and Prussia against Napoleon, but made peace with him at Tilsit, 5-322; rejoined alliance before retreat from Moscow, 1812; founder of the Holy Alliance, 3-315, 6-174.

Alexander II (1818-81). Tsar of Russia, 1855-81; freed the serfs in 1861; was assassinated by nihilists, 6-471.

Alexander III (1845-94). Tsar on Russia; rule marked by repression of all liberal ideas, and persecution of Jews, 6-474.

Alexander I (Obrenovitch) (1876-1903). King of Serbia; succeeded in 1889; assassinated.

Alexander III (1211) reigned 1249-86; Ruler of Scotland; and battle of Largs, 7-270.

Alexander (1888-1931). King of Yugoslavia (1921-31); made him self dictator in 1929; murdered at Marseilles in 1934 by one of his subjects, 7-520.

Alexander, Albert V., 1st Viscount Alexander of Hillsborough (b. 1885). Parl. Sec. to Board of Trade (1921). First Ld. of Admiralty (1929-31 1910-45, and 1945-46). Min. of Defence (1946). C.I.L. (1941). Chancellor of Duchy of Lancaster (1950-51).

Alexander, Mrs. Cecil Frances (1823-95). Eng. poetess; wrote tracts in connexion with Oxford Movement; poetical works include many hymns, 4-226.

Alexander, Sir George (1858-1918). Eng. comedy etc. From 1891 was manager of St. James's Theatre.

Alexander of Tunis, Harold Rupert Leofric George, Earl (b. 1901). Brit. soldier and administrator, 1-99 at Dunkirk, 3-137.

Alexander, Samuel (1859-1908). Australian philosopher; O.M. 1930, 6-160.

Alexander Archipelago. Is. of Alaska in Pacific Ocean, 1-88, 89.

Alexander Nevsky cathedral, Sofia, Bulgaria, 7-83 illus.

Alexander Severus (205-235). Rom. emperor; succeeded Heliogabalus in 217; murdered in insurrection.

Alexander's Ragtime Band (1911). Popular tune, 4-357.

Alexander Ypsilanti, Prince (1792-1828). Gk. soldier who served against Napoleon in the Russ. army. Headed a rising against the Turks in 1821, 4-78.

Alexandra (1841-1925). Queen consort of Edward VII., 1-100, 5-160.

ALEXANDRA

Alexandra Feodorovna (1872-1918). *Tsarina of Russia*; was Princess Alix of Hesse, granddaughter of Queen Victoria; shot with her husband and family by the Ural regional Soviet at Ekaterinburg, 5-432.

Alexandra Palace, public place of amusement at Muswell Hill, London, named after Q. Alexandra; present structure completed 1875; during the 1st World War German prisoners were interned here; television studios and transmitter opened 1936.

Alexandra Rose Day, founded by Queen Alexandra in 1912 1-100, 101.

Alexandretta. See *Iskanderun*.

Alexandria. Second city and chief spt. of Egypt; pop. 928,000, 1-101, 102 illus., 3-172; Alexander founded, 4-50, 98; importance in time of Ptolemies, 3-200; Pharos lighthouse, 4-502; Gk. library and culture, 4-92, 94, 486; anc. museum, 5-299; Farouk univ., 3-182; Stanley Bay beach, 3-177 illus.

Alexandria, Battle of. Fought in 1801, between British and French, and paved way for British occupation of Alexandria a few months later; the British commander Sir Ralph Abercromby was killed, and Sir John Moore wounded.

Alexandrite. Semi-precious stone. Dark green variety of chrysoberyl, found in Ural Mts.

Alexandropol. See *Leninakan*.

Alexandrovsik. See *Zaporozhe*.

Alexius I, Comnenus (1018-1118). Byzantine emperor, succeeded in 1081; brilliant soldier, efficient administrator.

Alexius II (1180-83). See under *Byzantine Empire* (rulers).

Alexius III (1195-1203). See under *Byzantine Empire* (rulers).

Alexius V (1204). See under *Byzantine Empire* (rulers).

Alfalfa. Plant, also known as lucerne, 1-102; 3-180.

Alfieri, Count Vittorio (1749-1803). It. dramatist and tragic poet; quality of his work, 4-330.

Alföld. Low fertile plain of cent. Hungary, 4-205.

Alfonso I (1094-1185). Founder of Port. kingdom; proclaimed king after victory of Ourique (1139) over Moors.

Alfonso VIII. King of Castile (1155-1211); succeeded his father, Sancho III, at age of 3; defeated Moors in 1212, 5-260.

Alfonso XII (1857-1885). King of Spain; in Bourbon family, 2-28.

Alfonso XIII (1886-1941). King of Spain, 1-102; in Bourbon line, 2-28; portrait, 4-129.

Alfred the Great (848-901). King of the W. Saxons, 1-103; translations of Latin texts, 3-283; coin, 5-235 illus. **Alfred's Jewel**, gold ornament in the Ashmolean Museum, Oxford, 1-104 illus.

Algae. A low type of plants, including seaweed, 1-104; 5-214; 5-128 illus., 1; in Red Sea, 6-375; colouring action on geyser deposits, 4-16; combine with fungus to form lichens, 4-190.

Algarroba [algarro'ba], a species of locust tree.

Algarve. Province of s. Portugal; products, 6-267.

Algebra. Branch of mathematics, 1-105; analytical geometry, 3-518, with diag.; series, 6-552.

Algeiras. Spt. and winter resort of s. Spain, on bay of Algeiras, 6 m. w. of Gibraltar; pop. 20,500.

Algeria. Fr. Overseas Dept. in N. Africa; area 847,500 sq. m.; pop. 8,076,010; 1-108, with map; children, 2-342, 343 illus. Suffered severe earthquake in 1954, with loss of over 1,000 lives.

Algiers. Dept. and city of s. Algeria; pop. of dept., 2,765,808; pop. of city, 315,210; extensive trade, 1-109; in Second World War, 7-493.

Alginates. Gum-like substances obtained from seaweed; uses, 1-405.

Algol. Remarkable double star in con-

stellation Perseus, one star dark, one light; reason for variation, 7-117.

Algonquins. Tribe of Amer. Indians, 6-371; village, 6-373.

Alhambra. Moorish palace and fortress at Granada, Spain, 1-111 illus., 1.

All [ah'le] (600/-461). Fourth Mahomedan caliph; married Mahomet's daughter, founding Fatimite line.

All, Amser (1849-1921). Muslim leader in India, 6-40.

All Baba. Hero of an "Arabian Nights" tale; obtains wealth of the "forty thieves" by learning magic password "Open sesame."

Allbi [al'ibi] (Latin, "elsewhere"). A form of defence in criminal cases by which the accused undertakes to show that he was elsewhere when the crime was committed.

Allcanto [ahlekahn'tal]. Seaport of w. Sp.; pop. 78,000; exports wine, fruit, oil.

Allie in Wonderland. Story by Lewis Carroll, 2-251; extract from, 2-252.

Aligarh. City in Uttar Pradesh, India; pop. 137,224; Muslim Univ., 6-40.

Alimentary canal, the system of connected internal organs by which higher animals assimilate food.

Aliphatic compounds, in chemistry 2-319.

Aliwal. Village of Punjab, India, on r. Sutlej; scene of battle between Brit. and Sikh troops in 1846.

Alizarin. Colouring matter extracted from the plant madder to obtain the dye known as turkey red. Artificially produced from coal-tar.

Alkali, a base that is soluble in water, 1-114; as inorganic base, 1-12; alkali industry, 2-321; in soap-making, 7-78, 80.

Alkali metals. Univalent metals of the first group in the periodic system, combining with water forming alkalis 1-112.

Alkaline earth metals. Bivalent metallic elements of the second group forming compounds resembling alkali metals, 1-112.

Alkaloid poisons, types, 6-236.

Alkmaar. Tn. in Netherlands, on N. Holland Canal; pop. 39,411; cheese trade, 2-314 illus., 5-376 illus.

Allah. Arabic name used by Mahomedans for God.

Allahabad. City of Uttar Pradesh, India, at junction of Ganges and Jumna rivs.; airport; university, pop. 333,362; pilgrimage centre for Hindus, 3-501.

Allahak'bar ("Allah is great"). Part of the Mahomedan call to prayer.

SYMBOLS USED IN ALGEBRA AND ARITHMETIC

+	(plus)	addition, positive
-	(minus)	subtraction, negative
±		plus or minus
=		is equal to
≠		is not equal to
≡		is identically equal to
×		multiplied by
÷		divided by
%		per cent.
‰		per thousand
√		square root
∛		cube root
a ⁿ		a multiplied by itself n times
1/a ⁿ		is proportional to
>		is greater than
≥		is not greater than
<		is less than
≤		is not less than
≧		is greater than or equal to
≦		is less than or equal to
∞		infinity

ALLSPICE

Allan, Sir William (1782-1850). Scot. painter of historical subjects; portrait of Burns, 2-132; portrait of Scott, 6-518.

Allan. R. of Perthshire, Scot., tributary of the Forth, 6-138.

Allard, Jules. Fr. acrobat who designed a flying machine for Louis XIV of France, 1-27.

All Blacks. New Zealand Rugby football team, 5-427.

Allbutt, Sir Clifford (1836-1925). Eng. physician; invented the short clinical thermometer; 5-165.

Allegheny Mountains. Part of the Appalachian system of N. Amer. 1-185, 7-103.

Allegheny r. rises in n. cent. Pennsylvania, U.S.A.; drains n.w. quarter of Pa. and south N.Y.

Allegory. A presentation of abstract thoughts or principles by means of stories, either in words or pictures; parables and fables are forms of allegory; examples. Cupid and Psyche, 3-11; Dante's *Divine Comedy*, 3-45; *Pilgrim's Progress*, 2-125.

Allegretto. See *Musical Terms* (table).

Allegro, in music, 5-305.

Allen, John (c. 1660-1711). Brit. engineer; marine jet engine, 4-370.

Allen, Ralph (1694-1774). English postal reformer and philanthropist, 6-270; and Bath, 1-383.

Allen, William (1532-94). Eng. cardinal; estab. (1568) college at Douai, Fr., for Eng. Rom. Cath. exiles.

Allen, Lough. Lake in Connacht Irish Rep., 5 m. long, by 3 m. broad; Shannon flows through 7-16.

Allenby, Edmund Henry Hynman

Allenby, Viscount (1861-1936). Brit. soldier, commander of Palestine expedition in 1st World War, 1-112.

All England Lawn Tennis (and Croquet) Club. Wimbledon; an affiliated body of the Lawn Tennis Assoc., which runs the Wimbledon championships, 4-161.

Allenstein [ah'len-sh'fint]. town formerly in E. Prussia, pop. 38,000; chief city of Masurian Lakes region, scene of Hindenburg's operations in 1914-15; incorp. in Poland, 1946, and as Olshyn made cap. of Masuria prov.

Allergy. In medicine, a specially sensitive and harmful reaction to substance, food, etc., which is normally harmless, 1-112; to proteins, 6-297.

Alleyn, Edward (1566-1626). Eng. actor and founder of Dulwich College, 1-113.

Alleyn's School, Dulwich, London, orig. part of Dulwich College, 1-113.

All Hallows Day. See *All Saints' Day*.

All Hallows Eve. See *Hallowe'en*.

All'ia. Small r. in anc. Italy, joins Tiber 12 m. above Rome; here Gauls defeated Romans, 390 B.C.

Alligator. Largest of the reptiles, related to the crocodile, 1-113, 1-157 illus., hibernation, 4-173.

Alligator Pear, fruit of a West Indian tree, also called avocado.

Alliteration. Figure of speech, 3-351.

Allioa. Tn. in Clackmannanshire, Scot.; pop. 13,436, 2-405.

Allotropy [alot'opi]. The existence of a chemical element in two or more solid, liquid, or gaseous forms, differing in physical properties but giving rise to identical chemical compounds. Sulphur for example exists in a number of allotropic forms.

Alloy. Mixture of two or more metals 1-114; aluminium alloys, 1-129, duralumin, 5-81; manganese alloy, 5-112; nickel alloys, 5-432; and science of metallurgy, 5-177; stainless steel, 4-296; type metal, 1-175, 6-288; silver alloys, 7-56.

All Saints' Day, formerly called All Hallows Day in Great Britain;

Christian Church festival held Nov. 1.

All Souls College, Oxford, 6-17.

All Souls' Day. Nov. 2, day set aside in Rom. Cath. Church for prayer and almsgiving on behalf of the faithful departed, 4-120.

Allspice, 7-131 illus. See also *Pimento*.

ALL'S WELL

All's Well that Ends Well, a comedy by Shakespeare (about 1595); plot based on story in Boccaccio's *Decameron*.

All-Union Lenin Library. Moscow, Russia, 4-187.

Alluvial deposits. Waste matter of rocks deposited by water; minerals from, 5-215; in valleys, 6-188; alluvial soil, 7-83.

Allyl. Volatile oil in onions, 5-511.

Alma, small r. of the Crimea; near its mouth in Black Sea, British, French, and Turks defeated Russians (1854).

Alma-Ata. Cap. of Kazakhstan S.S.R., 6-478.

Almaek's. (Inb founded in 1704 by William Almaek, 1-116.

Almaden (ahlmah/ken'), Spain, town 65 m. N. of Cordova; pop. 10,000; mercury mines.

Almagro, Diego de (c. 1475-1538). Sp. adventurer, associated with Pizarro in the conquest of Peru, 6-211.

Almanac. Year book or calendar, 1-117.

Almanach de Gotha. Work of reference giving information about European noble families, and political data; first publ. 1763, 1-117.

Almanach (ahlmah/neh), Spain, city; scene of Brit. defeat by France and Spain in 1707.

Alma-Tadema, Sir Lawrence (1836-1912). Brit. painter, b. in Netherlands; portrayed Gk. and Rom. life, 3-273.

Almería (ahlmär/ah), Spain. Seaport 60 m. S.W. of Granada, cap. of province of same name; pop. 84,900; founded by Phoenicians, became flourishing port and pirate headquarters under Moors; exports fruit, bombarded by Ger. battleship *Deutschland* in 1937.

Almond. Tree (*prunus amygdalus*) producing beautiful white or pink flowers and almond nuts, 1-117, 5-487 illus.

Almond, r. Scot., separating W. Lothian from Midlothian and flowing into Firth of Forth at Crummond 5-40.

Almonds. Oil of, from coal-tar, 2-434.

Almoner, career as, 2-236.

Almonry, of monastery, 6-244.

Almshouses, 1-118.

Alnus glutinosa. See *Alder*.

Alnwick. (an/ik) Co. tn. of Northumberland, Eng.; pop. 7,366; corn trade, brewing; castle, 5-161.

Aloe. Evergreen succulent plant, family *Liliaceae*. From leaves is made a drug used in anaemia and constipation.

Alost (ah'lost). Historic tn. in Belgium, midway between Brussels and Ghent; pop. 41,000; anc. cap. of Flanders; contained one of first printing presses in Europe.

Alpaca. Animal related to the llama, 1-119; wool, 4-330; cloth, 2-420, 419 illus.

Alp-Aralan (1029-72). Seljuk sultan (1063-72); conquered large part of Asia.

Alpenhorn, a long, curved wooden Swiss bugle; communication by, 7-212 illus.

Alpenstock, a long spiked pole used by mountaineers.

Alpha, α , A. (Rom. α , A). First letter of Gk. alphabet; much used in scientific nomenclature; in astronomy, the chief star of the constellation.

Alphabet, 1-119; Cyrillic, 1-440; Gothic, 1-440; Phoenician, 6-161.

Alpha-beta brass, type of brass; uses, 2-44.

Alpha brass. Very soft brass, 2-44.

Alpha Centauri, fixed star, 1-284; nearest visible star, 7-145.

Alpha Crucis. Star of the first magnitude, 7-146.

Alpha particles. Positively charged helium nuclei expelled by radioactive substances.

Alpha rays, radio-activity, 6-351; 1-297; radiation, 6-339.

Alpine Club. Brit. club; membership confined to those interested in

mountaineering, esp. in the Alps; founded in London in 1857, 5-284.

Alps. Mountain system of Europe, 1-120, 3-309; glaciers, 4-25, 7-312 illus. f.; Hannibal's crossing of, 4-127; tunnels, 7-328, 325 illus.

Alsace-Lorraine. Region of France, 1-126, 3-434; Ger. annexation, 3-316; iron ore deposits, 4-293.

Alsatian. Breed of large intelligent dog favoured as a guard, 3-100 illus. f., 3-104. See also *Dogs* (table).

Alsh, Loch. Lake in Ross and Cromarty, Scot., 6-455.

Altai Mts. Range in Mongolia and S. Siberia; highest point Bielukha (14,800 ft.); rich minerals, 6-472 4-413, 7-49.

Altair. Star of the first magnitude, 7-146.

Altamira. Palaeolithic cave in Santander prov. N. Spain; noted for prehistoric cave paintings, 6-33, 5-108 illus. f.

Altar of the Innocents, in the Church of the Nativity, Bethlehem; children slain by Herod, 1-439.

Alt'dorf, Switzerland, cap. of canton of Uri, on L. Lucerne; scene of story of William Tell. Pop. 4,000.

Altenburg (ahlt'enbörg), Germany. Mfg. tn. in Thuringia; pop. 42,500; grain and cattle trade.

Alternating Current (A.C.). An electric current the direction of flow of which changes, or alternates. The time of flow in one direction is called a half period, and the length of all half periods is the same. The flow in any one direction is called a cycle, and in domestic electricity supplies in Gt. Brit. there are usually 50 cycles per second, 3-213 with diag.; high frequency currents, 4-174; inductance, 3-216; production by dynamos, 3-143; in electric motors, 5-275.

Alternator. Type of dynamo, 3-143, 144 illus.

Althaea rosea. See *Hollyhock*.

Althing, the legislative body of Iceland; founded 930, has functioned almost continuously for more than 1,000 years; but present form from 1874; formerly under the Danish crown, it became independent in 1944; composed of 42 elected members who form an upper and a lower house, 6-86.

Altimeter. Aneroid barometer used to show the height of an aeroplane by measuring the reduction in atmospheric pressure below that at ground level.

Altmark. Ger. prison ship; captured Feb. 1940 by the *Cossack* (Capt. Vian) in Joesung Fjord, Norway; 299 survivors of Brit. ships, imprisoned in holds, were set free.

Altmühl, river of central Bavaria, flows 105 m. to join the Danube at Kelheim.

Alto. The highest adult male voice in a choir.

Alto-cumulus, clouds, 2-421, 422 illus.

Alton. Market tn. in Hants, Eng.; pop. 8,636.

Altona, Germany, seaport now forming part of city of Hamburg; pop. 241,000.

Alto relieve. Sculpture or carving in which design stands out prominently from the surface to which they are attached.

Alto-stratus, clouds, 2-423.

Altrincham (ol'tringam). Bor. of Cheshire; iron working and other industries; pop. 39,787.

Altruists (from Latin *alter*, "other"). School of philosophers, 6-159.

Alum, potassium aluminium sulphate, used as astringent in medicine, as mordant in dyeing, in tanning, fireproofing and shower-proofing; coal-gas by-product; in sulphuric acid mfr., 1-12; old alum works, 2-324 illus.; a double sulphate, 7-187.

Alumina. Mineral; trioxide of aluminium, occurring as corundum and in feldspars, etc.; alumina cement, 2-290.

AMBALA

Aluminium. The most abundant metallic element in Nature, forming 8 per cent. of the earth's crust, 1-127; alloys, 1-114, 116, 5-177; in Periodic Table, 3-224; aluminium paint, 6-38; aluminium bronze, 2-99; as backing for mirrors, 5-225; ore, 5-216; and chromium, 2-383; and ultrasonics, 7-344; ultra-sonic welding 7-436.

Alum root. Perennial plant, family Saxifragaceae, native to N. Amer. Root is very astringent, hence the name.

Alundum. Artificial abrasive made from aluminium oxide.

Aluta, Alt, or Oltu. R. of Rumania, rising on N.W. slopes of Carpathians, it flows 315 m. to the Danube, 6-470.

Alva, Fernando Alvarez de Toledo, Duke of (1508-83). Span. governor of the Netherlands, 1567-73, under Philip II. Imposed ruinous taxes and crushed religious liberties. Revolt broke out in 1568 and again in 1572, 7-154.

Alvarado, Pedro de (1486-1541). Sp. conqueror of El Salvador; second-in-command to Cortés in conquest of Mexico. Became governor of Mexico, and later of Guatemala, 6-493.

Alveoli. Tiny air sacs in the lungs, and respiration, 5-51, 52 diag.

Alwar. City in Union of Rajasthan, India; pop. 57,868.

Amadeus I (amādä'ooz) (1815-90). King of Spain, son of Victor Emmanuel II of Italy; accepted crown from revolutionists (1870); abdicated in 1873.

Amadis of Gaul. Title of famous medieval prose romance originally written in Portuguese, in imitation of the Arthurian legends.

Amalekites. An anc. tribe of Edomites, foes of the Israelites; crushed by Saul and David.

Amalfi. Seaport of Italy; pop. 7,400; 13th-cent. cathedral and old Capuchin monastery; in Middle Ages was a republic and rivalled Genoa and Pisa. Soap, paper, macaroni made.

Amalgam. A mixture of mercury with another metal, composition, 1-116.

Amalgamated Press, The, and Lord Camrose, 2-194.

Amanah (river). See *Abana*.

Amanita muscaria (fungus). See *Red-cap Amanita*.

Amanullah (b. 1892). Amir or King of Afghanistan (1926-29), 1-47.

Amara, Iraq. Tn. on the Tigris, about 150 m. N. of Persian Gulf; taken by British (1915).

Amaranth. Flowering plant of the genus *Ima arthrus*, such as love-lies-bleeding and Joseph's coat.

Amarna, Tel-el. See *Tel-el-Amarna*.

Amaryllidaceae. Botanical family of plants including daffodil and narcissus, 5-324.

Amasia. Ancient town of Asiatic Turkey, on the river Yesil-Irmak; pop. more than 60,000. 7-335 illus.

Amaterasu. Jap. sun-goddess, chief deity of Shintoism, 4-344.

Amateur Athletic Association (A.A.A.). Governing body for amateur athletics in Gt. Brit.; founded in 1880 at Oxford, 1-292.

Amati (amah'té). Ital. family of violin-makers at Cremona, of whom the most famous was Nicolo (1596-1684).

Amazon. R. of S. Amer., length 3,350 m. to 4,000 m., 1-129; forest, 2-15; navigation on, 2-49; rainfall, 1-148; monkeys, 5-240; valley, 7-96.

Amazons. Legendary female warriors, 1-130.

Amazonstone, variety of feldspar; gemstone, 3-345.

Am'ba Alagi (alah'gá). Abyssinian mountain fortress, 9,000 ft. alt., near Magdala; Duke of Aosta's surrender here in May 1941 to Imperial forces was virtual end of It. resistance in Abyssinia.

Ambala. Tn. of Punjab, India; pop. 78,336, 6-310.

AMBASSADOR

Ambassador. A minister representing one sovereign state in the capital of another, 1-131; 6-62.

Amber. Fossil resin derived from extinct coniferous trees, 1-131.

Ambergia. Grey fatty substance formed in intestines of spermaceti whale, 1-131; as fixative in perfume, 6-124.

Ambleside. Tn. in Lake dist., Westmorland, Eng., pop. 2,343; 4-438.

Amboina. See Amboyna.

Amboise. Tn. France, on r. Loire, 15 m. E. of Tours, 5-18 illus.

Amboyna or Amboina. Chief city and comm. centre of Molucca Isds., Indonesia, on Amboyna Isl. in N. of Banda Sea; pop. (nl.) c. 278,000.

Ambrose, St. (c. 340-397). Patron saint of Milan (where Ambrosian library is named after him); reformed Theodosius for Thessalonian massacres; introduced Ambrosian chant.

Ambrosia. In anc. myth., the food or drink of the gods, giving immortality; name later applied only to food, and drink of the gods was called nectar.

Ambush, H.M.S., British submarine, 7-175 illus.

Amélie-les-Bains. Spa in Fr. Pyrenees, 6-313, illus.

Amen. Word customarily added to the end of a prayer by Christians, 1-131.

Amenhotep I. Eg. king of 18th dynasty, reigned in 15th cent. B.C.; grandfather of Amenhotep III.

Amenhotep III. King of Egypt from 1411 to 1375 B.C.; great warrior and builder, 3-199; temple of Ammon, 4-187 illus.; colossal of Memnon, 3-197.

Amenhotep IV. King of Egypt. See Akhnaton.

America. Discovery and exploration of, 1-132; Columbus, 2-467; John Cabot, 2-103; Brit. colonization, 2-82, 7-153.

American aloe, or century plant; an agave, 4-67, with illus.

American bass. Fish, 3-370, illus.

American chameleon. Not true chameleon, 2-301.

American Civil War (1861-65). Struggle between the existing Federal government in the north and the new confederation in the south, which gave to the opposing forces their names of Federals and Confederates. The main cause of the war was the desire of the latter to secede from the union. After the bombardment of Fort Sumter by the Confederates, April 12, 1861, no fewer than 2,260 battles, sieges, and skirmishes took place before the last of the Confederate armies surrendered on May 26, 1865. The main battles were Bull Run, July 21, 1861; Shiloh, April 6, 1862; Fair Oaks, May 31, 1862; Antietam, September 17, 1862; Fredericksburg, December 13, 1862; Chancellorsville, May 1, 1863; Siege of Vicksburg, June, July, 1863; Gettysburg, July 1-3, 1863; Cold Harbor, June 3, 1864; naval battle of Mobile Bay, August 1864; Nashville, December 1864. The long struggle came to an end when the Southern general, Robert E. Lee, was forced to abandon his lines at Petersburg, where, for nine months, he had resisted all Gen. Grant's attempts to break through. His retreat was blocked at Appomattox Court House, where he surrendered, April 9, 1865; Lincoln and anti-slavery, 4-511; Jackson, 4-333; Lee, 4-474; slavery 7-66.

American Falls. Amer. part of the Niagara Falls, 5-429, 427, illus.

American football, 3-417.

American Independence, 1-137; Washington and, 7-421; Lafayette, 4-436; Burke and, 2-128; war of, 1-137; press gangs, 6-285; fighting in Pennsylvania, 6-120; contact mines first used, 5-219; battles in New Jersey, 5-398; migration of loyalists to Canada, 2-206.

American Independence, Declaration of (1776), drafted by Jefferson, 4-358.

American Indian languages, 6-158.

American Indians. This title includes the Indians of Cent. and S. Amer.; for N. American Indians see Red Indians; Bolivian dances, 1-509, illus.; tribes in S. Amer., 7-98.

American Legion. Association of ex-servicemen in the U.S.A., 4-476.

American Mother. A desert apple, 1-186, illus. f.

American Revolution. See American Independence.

American wood-borer. Insect, 4-267.

America's Cup. Trophy offered in 1851 for a race between British and American yachts; first secured by the schooner *America*. Recent results are 1930, *Enterprise* (U.S.A.) bt. *Shamrock* I; 1934, *Rainbow* (U.S.A.) bt. *Endeavour*; 1937, *Ranger* (U.S.A.) bt. *Endeavour II*; 7-509.

Americium (Am), new element, atomic number 95, named by Glenn T. Seaborg in 1946; produced by artificial radio-activity; 3-224.

Amersham. Tn. in Bucks, Eng. 26 m. W.N.W. of London; pop. 11,000.

Amery, Leopold (Charles Maurice) Stennett (1873-1955). Brit. journalist and politician; *The Times* war correspondent in Boer War; First Lord of Admiralty (1922-24); Sec. for Colonies from 1924, and also for Dominion Affairs from 1925 to 1929; Sec. for India, May 1910-13.

Ames, Leslie (b. 1905). Professional cricketer, a member of Kent County team from 1926, and of many England teams between 1928 and 1939. A wicket-keeper of the highest class and also a fine batsman; scored over 3,000 runs in 1933. In 1950 became first professional member of M.C.C. selection committee.

Amesia sanguiflua. A moth, 2-142, illus.

Amethyst. A precious stone, found in Ger., Hungary, Brazil, and Ceylon, 6-320.

Amharas. An African people, 1-6.

Amharic. Language spoken in Abyssinia, 1-6.

Amherst, Jeffrey Amherst, Baron (1717-97). Brit. soldier, succeeded Abercromby as commander in conquest of Canada from French; gov.-gen. of Brit. N. Amer. (1759-63); commander-in-chief Brit. army (1772-82, 1783-95).

Amherst, William Pitt, Earl (1773-1857). Brit. diplomatist, acted as envoy to China (1816); gov.-gen. of India (1823-8); raised to peerage (1826).

Amiens. City of Fr.; cap. of Somme dept.; pop. 84,787, 1-139; treaty (1802), 1-139, 5-319, 7-317; and World Wars, 7-482, 7-487.

Amines. In chemistry; as organic bases, 1-12.

Amino acids, and proteins, 5-144, 6-297.

Amleth. See Hamlet.

Amman. Cap. of Jordan; pop. 170,000; the Rabboth-Ammon of the Bible; camel-market, 4-382, 383, illus.

Amman, Jost. Swiss engraver (1539-91); woodcuts, 2-3, illus.

Ammersee. Lake 10 m. long in S. Bavaria.

Ammeter. Instrument for measuring electric current in amperes. Simplest type consists of an electromagnet which is energised by the current being measured. This in turn attracts the base of a pivoted needle moving across a dial marked in amperes and fractions of amperes. The movement of the pointer and therefore the amount of amperage measured is governed by the strength of the magnet, which in turn depends on the strength of the current; in motor vehicle, 5-282.

Ammon, or Ammon-Ra. Chief god in Eg. myth., originally local god of Thebes; represented with ram's horns; temple, 3-187 illus.; Siwa temple and ammonia, 1-140.

Ammonia. Colourless gas, with a pungent odour and alkaline properties, extremely soluble in water,

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1-140; composition, 1-112, 5-443; shape of molecule, 2-519, diag.; in gas, mfr., 3-307; in refrigeration, 6-378; in industrial chemistry, 2-325, 326.

Ammonia sulphate. Ammonia and sulphuric acid; used as fertilizer, 1-140.

Ammonites. Fossil snail-like molluscs, now extinct; ancestor of the pearly nautilus found in Pacific and Indian oceans, 5-232, 3-125, illus.

Ammonites. Semite tribe living E. of the Jordan, finally subdued by Judas Maccabaeus; and Israelites 4-371.

Ammonium carbonate, or Sal volatile, 1-112, 1-140.

Ammonium chloride. Sal ammoniac 1-140.

Ammonium hydroxide. Ammonia gas, with water, "ammonia," 1-140.

Ammonium nitrate. Ammonia and nitric acid; 1-140; nitrogen from, 5-443.

Ammunition. Artillery supplies, 1-260.

Amnesia. Loss of memory, 5-167.

Amoeba. The simplest form of animal life, consisting of one cell, and multiplying by division, 1-140; behaviour, 1-152; as simplest form of protozoa, 6-298; respiration 6-389; 1-157, illus.

Amoebic dysentery, 1-141.

Amorites. Semite people who conquered the Sumerians and Akkadians in Mesopotamia; Hammurabi (2123-2081 B.C.) and first Babylonian empire, 5-176.

Amos. Hebrew prophet (8th cent. B.C.), earliest of the "writing prophets," 6-298.

Amoy. City and spt. of S. China; pop. 231,000; exports tea, porcelain, paper. Name from Chinese *Hiaman*.

Ampere, Andre Marie (1775-1836). Fr. physicist; a pioneer of electro-dynamics; his memory, 5-168.

Ampere. In electrical engineering, the practical unit of current energy. A current at a pressure of one volt passing through a conductor having a resistance of one ohm registers one ampere (amp.). Named after André Marie Ampere, 3-210; measured by electrolytic means, 3-221.

Ampere-Hour. Unit of quantity of electricity. It is the quantity represented by a flow of one ampere for a period of one hour; or an equivalent quantity, e.g. two amperes for 1 hour. One ampere-hour is equal to 3,600 coulombs.

Amphibia. Class of vertebrate animals including frogs, toads, newts, etc.

Amphibious craft. The "Alligator," 1-252, illus.

Amphiboles. A group of minerals, in shades of brown or green found in certain igneous and metamorphic rocks. Best known are hornblende and a type of asbestos, 5-214.

Amphibrach. In poetry, 6-233.

Amphimacer. In poetry, 6-233.

Anphineura. Class of molluscs, 5-233.

Amphioxus, also called Lancelet. Genus of aquatic sand-burrowing animals resembling primitive vertebrates.

Amphisbaena. Type of lizard, 4-529.

Amphitheatre. In classical times, roofless, almost circular, building with tiered seats for watching public shows; Colosseum at Rome, 2-461; arena at Nîmes, 6-438, illus.; theatre at Epidaurus, 4-93, illus.

Amphitrite (amftr'itl). In Gk. myth., sea-queen, daughter of Nereus and wife of Poseidon.

Amphora (am'fora). Anc. Gk. vessel for holding liquids, 1-11, illus.

Ampleforth Abbey, Yorks, Eng.: as 19th cent. foundation, 1-3.

Amplification, in electricity, 3-222.

Amplifier, and radio, 6-316, 310 illus. f.

Amritsar. India. Cap. of dist. of same name in E. Punjab; pop. 400,000; centre of Sikh faith; silks, shawls, carpets; scene of riot in 1919.

Amstel, riv. of Netherlands; Amsterdam on, 1-141.

Amsterdam. Commercial cap., largest city, and spt. of the Netherlands;

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pop. 845,866; 1-141, 5-370; Bank and Dutch commerce, 1-361, 363.
Amsterdam-Rhine Canal, Netherlands. Connects Tiel with Amsterdam. opened 1952; 45 miles long.
Amu-Daria (anc. Oxus). Great riv. of cent. Asia, rising on Pamir Plateau and flowing about 1,500 m. s.w. to Aral Sea, 1-266.
Amundsen, Roald (1872-1928). Norwegian navigator and explorer; first man to reach S. Pole; 6-244; polar flight, 6-243 illus.; and N.W. pass, age, 2-200.
Amur. Great navigable r. of E. Asia (2,920 m.); gives name to prov. in Siberia N. of river; 1-288, 5-112, 7-48.
Amylop'sin. Starch-digesting ferment secreted by pancreas.
Anabaptists. A 16th-cent. religious sect.
"Anabasis." Xenophon's account of the expedition sent by Cyrus the Younger against Artaxerxes.
Anabolism. The chemical process by which living matter builds up complex proteins.
Anaconda. Giant non-poisonous snake of python family; native of Brazil and Guiana, up to 30 ft. long; 2-45 illus.; 7-75 illus.
Anacreon (563-478 B.C.). Gk. lyric poet; famous for songs of love.
Anadir, r. of Far Eastern Region U.S.S.R., about 500 m. long.
Anaemia. A disease of the blood, 1-491; from malaria, 5-93; liver extract in treatment of, 4-524.
Anaerobic organisms. Those which exist without air, e.g., the bacteria which cause ptomaine poisoning and origin of air, 1-82.
Anaesthesia, in medicine, 1-142, 5-165 use of ether, 3-302.
Anaesthesia. Drugs administered in surgery to render the body or part of the body free from pain, 5-165.
Anaesthetist, work of, 1-143.
Analests, of Confucius, 2-480.
Analysis, chemical, 2-324.
Analysis situs, in geometry, 3-520.
Analytical geometry. Method introduced by Descartes for applying processes of algebra and analysis to geometrical problems; 3-518 with diag.
Analytical psychology, Jung's theory 4-386.
Ananias. An early Christian who, with his wife Sapphira, was struck dead for lying (Acts v, 1-10).
Anapest, in poetry, 6-233.
Anarchy, anarchistic theory and government, 4-49.
Anastasius I (491-518). See under Byzantine Empire (rulers).
Anastasius II (713-715). See under Byzantine Empire (rulers).
Anathema. A formal cursing by the church of a wrongdoer, 2-380.
Anatolia. Mod. name for Asia Minor, 1-274. See also Turkey.
Anatolic languages, 4-445.
Anatomy. Scientific study of the bodily structure of animals 1-143; bone, 1-518; skull, 7-61; skeleton, 7-60; dissection, 5-161; Leonardo's work on, 4-484; Hunter and, 4-208; men and birds compared, 1-31; of birds, 1-463, 451 illus.; of insects, 4-264, 265; of plants, 2-24; of human foot, 3-414 with illus.; and surgical training, 7-195.
Anaxagoras (anaksa'goras). Gk. philosopher of 5th cent. B.C., teacher of Pericles, 6-123.
Anchises (ankis'ez), in Rom. myth., Trojan hero, father of Aeneas, 1-23.
Anchorage. Tn. in Alaska: pop. 11,500, 1-91.
Anchor-buoy, 2-128 illus.
Anchor escapement, in clocks, 2-414.
Anchovy. Fish of herring family, 4-171.
Anclon Regime. Term used for the social and political system which was established in France before the Fr. Revolution (1789).
Ancient Mariner, The. Narrative poem by Coleridge: story and quotations, 2-449.
Anconna. It. sp. off N.E. coast; pop. 89,000; triumphal arch of Trajan

A.D. 115; sugar-refining, shipbuilding, silk, paper.
Anous Marcius. Rom. king; rule, 6-429.
Andalusia. Beautiful fertile dist. (formerly province) in S. Spain; chief city, Seville; fruit, olives, grain; 7-104 bridge, 7-101 illus. f.
Andaman and Nicobar Islands. A centrally administered territory of the Rep. of India; area 3,143 sq. m.; pop. 30,963, 4-241.
Andante, in music, 5-305.
Andermatt, Switzerland; winter sports centre in the cañon of Uri, in valley of r. Reuss; avalanche damage 1-328 illus.
Anderson, Hans Christian (1803-1875). Danish writer, best remembered for his fairy tales for children 1-144; *The Constant Tin-Soldier*, 1-145; a children's writer, 2-354.
Anderson, Carl David (b. 1905). Amer. physicist; during research on gamma and cosmic rays, discovered the positron; Nobel prize in 1936.
Anderson, Elizabeth Garrett (1836-1917). First Eng. woman physician; first Eng. woman mayor; a London hospital was named after her.
Anderson, Sir John. See Waverley, 1st viscount.
Anderson, Maxwell (b. 1888). Amer. author, playwright; plays *Saturday's Children*; *Wintersend* (blank verse), 7-366.
Anderson, Mount. Highest point (7,490 ft.) in the Drakensberg Mts. in the Transvaal, 7-308.
Andes. Mt. system of S. America, extending from Isthmus of Panama to Tierra del Fuego, 4,500 m., 1-148; Trans-Andean rly., 2-359; and climate of Peru, 6-138; volcanic eruptions, 7-96; minerals, 7-97.
Andhra. State of India, inaugurated Oct. 1, 1953. Area 67,000 sq. m. Pop. 21,282,000. Formerly the northern part of Madras state. It was separated from Madras on a linguistic basis, the majority of its people speaking Telugu (the greater number in the reduced state of Madras are Tamil-speaking). Provincial capital, Kurnool.
Andijan, Tn. in Uzbekistan, U.S.S.R., pop. 83,000; terminus Trans-Caspian rly.; centre of vast cotton dist.
Andorra. Small state in the Pyrenees; area 191 sq. m.; pop. 5,006, 1-149, 6-311.
Andover. Market tn. in Hants, Eng., on r. Anton; pop. 11,660, 4-123.
Andrea del Sarto. See Sarto, Andrea del.
Andrea di Cione. See Orcagna.
André, Salomon August (1851-97). Swedish scientist; tragic polar balloon flight, 1-354, 6-241.
Andrew, St. One of the Twelve Apostles, patron saint of Scot. and Russia; his festival day, Nov. 30, celebrated as the Scots national day, 1-181; cross of, 2-535.
Andreyev, Leonid (1870-1919). Russ. writer of stories and plays reflecting a morbid outlook, 6-480.
Androcles. In Rom. legend a slave, famous for his association with a lion from whose paw he extracted a thorn. Later as a Christian prisoner condemned to die in the arena, he met the same lion who fawned on him. He was forthwith pardoned and the lion given to him.
Androecium. Collection of stamens in flower, 3-397.
Andromache. In Gk. myth., wife of Hector; after the fall of Troy, taken captive by son of Achilles. Her story is told in a tragedy by Euripides.
Andromeda. In Gk. myth., wife of Perseus, 6-128.
Andromeda. Constellation; nebula in, 1-282 illus.; 5-360 7-149.
Andronicus I (1183-85). See under Byzantine Empire (rulers).
Andronicus II (1282-1328). See under Byzantine Empire (rulers).
Andronicus III (1328-41). See under Byzantine Empire (rulers).
Andros, Greece. Fertile mountainous isl. in Aegean Sea; one of the Cyclades.

ANGUS

Androsoggin river, New England, U.S.A.; length 160 m., 5-397.
Anecdotal painting, in England, 3-273.
Anemograph. Appliance used for recording the pressure or velocity of the wind, 7-458 illus.
Anemometer. Instrument for measuring wind speed and directions, 7-459.
Anemone. Plant of buttercup family, 1-150; sepals, 3-400.
Anemone Sea. See Sea-anemone.
Aneroid barometer, 1-371.
Aneto Mt. See Pic de Néthou.
Angara, in Siberia, important affluent of the Yenisei, length about 1,300 miles.
Angel-fish, sometimes called angel-shark, a fish with wing-like fins, belonging to the chaetodon family, found chiefly in tropics, 1-187, 188, 189 illus. f.; 3-frontis.; 3-371 illus.
Angelico, Fra (fruh anjel'iko) (1387-1455), the painter friar Fra Giovanni da Fiesole, painted only sacred subjects, 4-317.
Angels. According to apocryptic literature, the chief archangels are Michael, the prince; Gabriel, the angel interpreter; and Raphael, who, with Uriel, 'Chamuel, Jophiel, and Zadkiel stands before God.
Angelus. A bell rung in Cath. countries morning, noon and night, inviting faithful to prayer.
Angers (ahn'zhä), France. Mfg. city on r. Mayenne; pop. 94,408; cap. former duchy of Anjou; slate quarries.
Angerstein, John Julius (1735-1824). Br. merchant and art collector; and National Gallery, 2-451.
Angwin Line. See Plantagenet, House of.
Angina pectoris. Symptom of heart disease; an excruciating pain in the chest and left arm, 4-145.
Angiosperms. The greatest division of seed bearing plants (spermatophytes), including the true "flowering" types, 2-24 6-211, 6-529 7-315.
Angkor. Ruined city of Cambodia Indo-China; remains of palaces and temples. To the S. is Angkor Vat, a great 12th cent. Khmer temple 2-179, 180 illus.
Angles. Teutonic tribes which invaded and settled in Brit. after withdrawal of Rom. legion, 2-75, 3-276, 5-199.
Anglesey. Island county of N. Wales, 275 sq. m.; pop. 50,367; 1-150 druids, 3-127.
Anglicans. Members of Church of England and of associated Churches in other countries.
Angling. See Fishing.
Anglo-Cymric soors. Form of Welsh numerals, 3-106.
Anglo-Egyptian Sudan. See Sudan.
Anglo-Saxon Chronicle, begun by Alfred 1-101.
Anglo-Saxon language. See Old English.
Anglo-Saxon Literature. See Old English Literature.
Angola, or Portuguese West Africa, area 481,500 sq. m.; pop. 4,111,790, 6-268; settlement estab., 1-55 diamonds, 3-83 7-441.
Angora. Former name of Ankara, cap. of Turkey.
Angora goat, 4-37, 1-158.
Angora rabbit, 6-327 illus., 528.
Angostura. Bark of a Venezuelan tree yielding a drug used in cases of fever and dysentery; also basis of angostura bitters.
Angoulême (ahn-goo-läm), Fr. city on r. Charente; pop. 36,700; paper, wine, linen; cathedral begun in 1101.
Angra do Heroísmo. Tn. in Terceira, Azores; pop. 12,500, 1-330.
Angström. A unit of length used in measuring the wavelengths of light, ultra-violet radiation and x-rays. It is equal to one hundred-millionth of a centimetre (10⁻⁷ cm.). Named after Anders Jonas Ångström (1814-71) Swedish physicist, who measured wavelength of light.
Angular measure. See Weights and Measures.
Angus, Scottish co.; 873 sq. m.; pop. 274,800; co. tn. Forfar; 1-181.

ANHALT

Anhalt. Former state of Ger., now included in *Land of Saxony-Anhalt*.
Anhwel. Inland province of China in E.; 87,900 sq. m.; pop. 22,705,000; cap. Hwaining.
Animal Behaviour. 1-151; courtship of rooks, 6-449; homing instinct, 4-189; lyre bird, 5-56; migration, 5-202; herring, 4-477.
Animal charcoal, or bone-black; used as decolorizing agent, or as pigment; manufacture, 1-519.
Animalcule. An animal of microscopic size; plankton, 5-127.
Animal Kingdom. 1-154.
Animals. 1-156; family tree, 1-155 diag.; biology of, 1-148; nature study, 5-332; compared with plants, 1-154; ecology, 3-158; protozoan, 6-298; prehistoric animals, 6-281; mammals, 5-100; reptiles, 6-388; animal behaviour, 1-151; hibernation, 4-173; in Arctic regions, 1-222; protective coloration, 6-296; colour in, and Tyndall blues, 2-163; selective breeding, 4-168; reflecting layer in eyes, 3-331; field of vision, 3-334; oxygen necessary for life, 6-23; protein, 6-297; animal parasites, 6-78; skins and hides, 7-63; skeleton, 7-60; mummified animals, 5-295; in Rom. circuses, 2-101; and superstitious, 5-77; animal stories, 2-351; sponges, 7-137. *See also* Biology; Cell; Evolution; Heredity, etc.; and individual animal and animal groups, e.g. Birds; Fish.
Animals, Groups of. Collective nouns 1-156.
Animals' V.C. *See* Dickin Medal
Animal waxes. 7-132.
Animal worship. In anc. Egypt, 3-199; sacred cow in India, 4-241 illus.; snakes, 7-75.
Animated cartoons. how they are made 2-391, 395 with illus.
Animato. *See* Musical Terms (table)
Animism. The attribution of a living soul to inanimate objects and natural phenomena
Anion (an ion). Negative ion in a solution which during electrolysis moves to the anode, 1-278.
Anis. Tropical Amer. bird; m. fine habits, 1-457.
Anise. A plant of the parsley family native of N. Africa, widely cultivated in Ger., s. Europe, India; small fruits carry aromatic essential oil.
Anjou (anjuhoo). Fief of medieval Fr. on both sides of Loire; cap. Angers; held by Eng. (1154-1201).
Ankara. Capital of Turkey; population, 256,781; 1-156; 7-332, 333 (map).
Anker. *See* Weights and Measures (table).
Ankle, part of foot, 3-412.
Anklet. Article of jewelry; origin of use, 4-372.
Anna. Indian coin; 16 to the rupee.
Annam. Indo-China. Former Fr. protectorate now included in the state of Vietnam, 4-256, 7-399.
Annamese. People and language of Indo-China, 4-257.
Annan. Scot. spt. tn., Dumfriesshire; out products; boiler-making, and leather, rope, cotton industries; pop 1351.
Annan. R. of s. Scot., rising near sources of the Clyde and Tweed it flows s. for 50 m. to Solway Firth; salmon and trout fishing, 3-131.
Annapolis. Cap. of Maryland, U.S.A.; has U.S. naval academy; oyster canning industry; pop. 13,000; 5-143.
Annapolis. Tn. in Nova Scotia on arm of Bay of Fundy; founded as Port Royal by Fr. in 1604; pop. 784; Champlain's settlement, 2-199; 5-170.
Annapurna. Mt. in Himalayas, Nepal, 26,493 ft., 4-176.
Anne (1665-1714). Queen of Eng. 1702-13, 1-158 accession, 3-281; friendship with Duchess of Marlborough, 5-132.
Anne (Boleyn). English queen; *see* Boleyn.
Anne (1366-94). Eng. queen and Bohemian princess, sister of King Wenceslas IV; married Richard II of England (1381), 1-504.

Anne (1456-85). Queen consort of Richard III, daughter of Richard Neville, Earl of Warwick. Originally betrothed to Edward, son of Henry VI, but after his death at battle of Tewkesbury, married Richard (1474).
Anne of Austria (1601-66). Daughter of Philip III of Spain; Queen of Louis XIII of Fr.; regent during minority of her son Louis XIV; her chief minister Mazarin, 5-150.
Anne, of Beaujeu; Fr. princess, sister of Charles VIII; as Charles' adviser, 2-309.
Anne of Cleves (1515-57). 4th Queen of Henry VIII of Eng.; divorce, 4-164.
Anne (b. 1950). Brit. princess, second child of Queen Elizabeth II and the Duke of Edinburgh, second in line of succession to Brit. throne 3-234.
Annealing. Process of heating substance and cooling slowly to make it less brittle.
Annelida. Group of segmented worms; in zoological classification, 1-151; 7-500 and illus.
Annet. Small islet in the Scilly Isles, famous as a bird sanctuary, 3-509.
"Annie Laurie." Famous Scots song, words by William Douglas; a real person, daughter of Sir Robert Laurie, first baronet of Maxwellton.
Anning, Mary (1799-1847). Brit. geologist, 1-159.
Annual parallax, of star; and measurement of distance, 7-145.
Annual plants, 6-218.
Annuizio, Gabriele d' (1863-1938). Italian writer, 1-159, 4-330.
Anode. The electrode or point through which a current enters an electrolytic cell, gas discharge tube, or a thermionic valve, from an external source of electromotive force, 1-386, 3-220, 7-376, 78, 30" with illus.
Anopheles. Genus of malaria carrying mosquito, 5-93, 5-271 with illus.
Anopla (zool.) Order of insects, in classification of insects, 4-270.
Anouilh, Jean (b. 1910). Fr. writer. Plays include *Point of Departure* and *Ring Round the Moon*; also made number of films.
Anschluss. German, "a joining." Denotes a union between two countries, either politically or under a customs agreement. Applied particularly to the proposal to join Austria to the German Reich, effected in March 1938, and ended May 1945; 1-321.
Anselm, St. (1033-1109). Medieval philosopher and Eng. saint; Archbishop of Canterbury (1093-1109), 6-160 7-452.
Anser. *See* Goose.
Anson, George Anson, Baron (1697-1762). Brit. admiral, commanded victorious expedition against Spaniards (1740); defeated Fr. navy off Eilat (1717), for which he was raised to peerage. First Lord of the Admiralty, 1751-56.
Anson, H.M.S. Brit. battleship, displacing 35,000 tons; covered munitions convoys to N. Russia; flagship of Rear Adm. Harcourt at Jap. surrender, Aug. 30, 1945.
Answer. *See* Musical Terms (table).
Ant. 1-160; fungus gardens, 3-489; ants' eggs as aquarium food, 1-148.
Antaeus. In Gk. myth., a giant, son of Poseidon and Gaia; slain by Hercules, 4-166.
Antakiyeh. *See* Antioch.
Antananarivo. Cap. of Madagascar; pop. 171,000, 5-65 with illus.
Antarctica (Antarctic continent), 1-163; explorations, 2-147; Scott's expedition, 6-515; Shackleton, 7-10; ice-sheet, 4-25; midnight sun, 5-200; pack ice, 6-244 illus.; penguins, 6-115.
Antarctic Circle, latitude of, 4-453.
Antarctic Ocean. Waters surrounding Antarctic Continent; some modern geographers consider these waters as southern ends of Atlantic, Pacific, and Indian oceans, 5-494; life in, 1-164.
Antares. Star of the first magnitude 7-146.
Ant-bear. African ant-eater, 1-170 illus.

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Anteater. A marsupial, 1-170, 5-137; claws, 5-102.
Antelope. 1-170; composition of horns, 4-194.
Antennae of insects; sense of smell, 4-204; of ants, 1-160; of butterflies and moths, 2-136, 2-145 illus.; of drone honey bee, 1-406.
Antennule, a small feeler in front of the true antennae of crustaceans.
"Ant-guests," in ants' nest, 1-163.
Ant. In plants, 3-397 398 illus., 2-25 illus. f.
Anthony, St. (c. 251-356), b. in Egypt, lived in solitude for years, resisted many temptations which are favourite subjects in literature and art; founded Christian monasticism, 5-243; cross of, 2-535.
Anthony of Padua, St. (1195-1231), most celebrated of followers of St. Francis of Assisi; wonderful preacher; legends tell of fishes leaping from the water to hear him; fine scholar.
Anthozoa. Zool. class of "flower-animals"; sea-anemones, 5-129 illus.
Anthracene. Colourless crystals with blue fluorescence, obtained from the fraction of coal-tar, known as anthracene oil; in "glowing lumps," 6-162.
Anthracite. Non-bituminous coal, with high proportion of fixed carbon, 2-428; heating value, 2-133.
Anthrax. An infectious disease; isolation of bacillus, 4-11 with illus.; Pasteur discovers vaccine, 6-95.
Anthropoid. Name given to a group of apes.
Anthropology. The science of Man, his physical structure, customs and languages, arts and religions, distribution and civilization; Frazer's work and Golden Bough legend, 3-161; 5-104.
Anthropometry. Science of the physical measurement of Man, his height, weight, and skull shape; a branch of anthropology.
Anthropomorphism. Representation of God, or of the gods, in human form.
Anti-aircraft artillery, 1-171 radar and, 6-338; rocket weapons, 6-424.
Antibes. Spt. of Fr. 13 m. S.W. of Nice. Fishing and perfumery indus.; pop. 26,000, 6-403.
Antibiotics. Substances produced by living organisms which inhibit growth of certain germs, or kill them, 1-174 3-127, 5-165.
Antibodies. Substances created in the body to combat disease germs; and biochemistry, 1-146.
Antioipation. *See* Musical Terms (table).
Anti-Comintern Pact. Signed between Ger. and Japan (Nov. 25, 1936), aimed against Communism; Italy (1937), Manchukuo, Hungary and Spain also joined. Pact lapsed on signing of Ger.-Russ. pact, Aug. 1939; was revived 1941, when Ger. attacked U.S.S.R.
Anti-cyclone. In meteorology, an area of high atmospheric pressure, 3-16; 5-180.
Antietam, battle of (1862), in Amer. civil war, 5-143.
Antigone (antig'one). In Gk. myth., dau. of Oedipus; follows father into exile; buries brother in defiance of king's order; tragedy of Sophocles, 7-85; 5-505.
Antigua (an-tig'-wa). Isl. of Brit. W. Indies, incl. in Leeward Is. group of which St. John is cap. A. 108 sq. m.
Anti-Lebanon Range. Range of mts. parallel to Lebanon mts, 4-472.
Antilles (an-till'ez) (Greater and Lesser). Is. of W. Indies, 7-142 with map.
Antilia. A former land-mass which is said to have separated the Atlantic Ocean from the Caribbean Sea. This is now partly submerged, the portions visible being the West Indies 7-442.
Antilogarithms, 5-17.
Antimonite. *See* Stibnite.
Antimony. Chemical element, 1-175, 3-224; sulphide of, and safety matches, 1-176.
Antinodes, and sound, 7-86 with illus.
Antinous (d. 132). Favourite of Emperor Hadrian; bust, 6-444 illus.

ANTIOCH

Antioch, tn. in Turkey; pop. 28,000. 1-176.
Antiochus [ant'io:kus] I, Soter. King of Seleucid dynasty in Syria; ruled c. 280-271 B.C.; conquered Palestine.
Antiochus III, the Great, of Syria; ruled 223-187 B.C.; sheltered Hannibal and warred with Rome.
Antiochus IV, Epiphanes [epi'fan'ez], of Syria; ruled 176-164 B.C.; and Jews, 4-375.
Antope. Sister of the Amazon queen, Hippolyte; and Theseus, 1-130.
Antipater (d. 43 B.C.). Ruler of Judaea, appointed by Julius Caesar, 4-375.
Antipodes [anti'pōdēz] ("with the feet opposite"). A region on the opposite side of the earth, New Zealand is regarded as the Antipodes of England; also small uninhabited Isl. S.E. of New Zealand.
Antipope. A usurping pontiff or one elected in opposition to the pope canonically chosen.
Antirrhinum. Perennial garden plant of family *Scrophulariaceae*; popularly called "napdragon". Simple, opposite leaves, and brightly coloured flowers; lower lip of large tubular corolla snaps shut if opened; cross section, 3-395 diag.; seeds, 6-628.
Anti-Semitism. Repressive measures against Jews (Semites) had until after the 2nd World War formed part of the policy of several countries, notably Germany, Italy, Russia, Poland, and Rumania.
Antiseptics and Asepsis, 1-176, 5-165; Lister, 4-522; in surgery, 7-191-95.
Anti-submarine weapons, the "Squid", 5-349 illus.
Anti-tank weapons mine, 5-218, illus., rockets, 6-424; shell, 1-260.
Antitoxin. In medicine, a substance with the power of neutralising the action of a bacterial poison or toxin. Consists of serum obtained from blood of a living animal which has been made immune from the disease to be cured or prevented. Used in treatment of diphtheria and tetanus.
Antlers, 4-194; of reindeer, 6-370; of stag, 3-59, with illus.
Ant-lion. Insect, 1-178.
Antiochagasta [ant'io'ga'sta] Spt. in N. Chile, cap. of prov. of same name; pop. 53,000; ships much nitrate; silver smelters.
Antonine, Ion (1882-1946). Fascist dictator of Rumania, 1940-44, 6-471.
Antonine period of Rom. art (138-180 A.D.); statue of Marcus Aurelius, 6-441, illus.
Antonie Wall. Earthwork in Scotland stretching from the Forth to the Clyde; abandoned by Severn, 2-76.
Antoninus Pius (86-161). Rom. emperor (138-161); adopted as son and successor by Hadrian, 6-439.
Antonius, Marcus. See Mark Antony.
Antony and Cleopatra. Play by Shakespeare, 6-129.
Antrim. Co. of N. Ireland; pop. 674,800; area 1,176 sq. m.; co. tn. Antrim, pop. 1,660; 1-178; geological composition of mts, 2-88; Giant's Causeway, 4-18 with illus.
Antrycide. Synthetic drug which gives cattle immunity for about six months from cattle disease caused by the tsetse fly.
Antwerp. City and chief port of Belgium, cap. of Antwerp prov.; pop. of city, 262,037; 1-178, 1-419 illus. 7-487.
Antwerp, the. Variety of pigeon, 6-198.
An Uaimh. See Navan.
Anu'bis. Anc. Eg. deity. Conducted souls of dead to lower world and assisted Osiris at final judgment.
Anuradhapura. Vast ruined city of Ceylon, 356 sq. m. in area; now a place of pilgrimage; rock temple, 3-298 illus.
Anxiety state, or nervous breakdown, 6-300.
An'zacs. Members of the Australian-New Zealand Army Corps in 1st World War; served in Gallipoli campaign, later in Fr.; the word is made by taking the initial letters.
An'zie Beaches, Battle of. Landings made N. of Anzio. It. by Anglo-U.S.

forces on Jan. 22, 1944; ground held under constant bombardment and 270 attacks by Luftwaffe, until link-up by patrols of 5th Army from S.E. on May 25; 7-144.

Aonagh Mor. Mt. Inverness-shire. Scot. (3,999 ft.), 4-275.

Aorta. Main artery of the body; in circulatory system, 4-144 with diag.

Aosta [ahos'tah]. Almone, Duke of (b. 1900). It. nobleman, younger brother of Amadeo Umberto; in May 1941 made King Tomislav of Croatia, at Mussolini's instigation, after whose fall he renounced crown, having never visited his kingdom.

Aosta, Amadeo Umberto, Duke of (1898-1942). It. soldier; second cousin of Victor Emmanuel III; succeeded Graziani as Viceroy of Abyssinia in 1937; became c.-in-c. It. E. Africa; at Amba Alagi his surrender to Brit. forces virtually ended Abyssinian campaign; died in captivity.

Aoudad, or Barbary sheep. Wild sheep found in N. Africa, 7-20.

Apaches. Amer. Indian tribe of S.W. U.S.A.; in New Mexico, 5-400; basket making, 1-238.

Apatites. Hard rocks containing calcium phosphate; phosphorus from, 6-102.

Ape. Anthropoid or Man-like monkey 1-179; genealogical tree, 3-323 diag., chimpanzee, 2-360, 7 illus. 526; gibbon, 4-18; gorilla, 4-18; orang utan, 5-526.

Apeldoorn. Netherlands city; pop. 91,073; summer palace of Queen; the chief industry is paper making.

Apelles [apel'ēz] (1st cent. B.C.), most celebrated Gk. painter; court painter of Philip of Macedon and Alexander the Great, 4-89.

Apennines. Mt. system of Italy, running the length of Italy and Sicily, about 800 m. long, 1-180 3-309. Mandrioli pass, 4-308 illus.

Aphasia. Disorder of speech from injury to, or disease of, the brain, or brain haemorrhage.

Aphis. Plant louse, 1-182; and ants 1-182.

Aphrodite. In Gk. myth., goddess of love and beauty, who sprang full-grown from the sea-foam; identified with Rom. Venus, 7-348-89, 389 illus., mother of Aeneas, 1-25; and Trojan Wars, 7-320; anemone myth, 1-150; and Cyprus, 3-21.

Apia. Chief tn. and spl. of Samoan Isl. on N. coast of mainland, 6-494; rainfall, 6-360.

Apis [ā'pis]. In Eg. myth., sacred bull worshipped at Memphis; represented an incarnation of the god Osiris, 3-199, 6-7.

Apis (genus: hive bee). See Bee.

Apo. Highest peak on Mindanao, Philippine Isl., 10,312 ft., 6-156.

Apocalypse [apok'alipt] ("Revelation"), last book of New Testament.

Apocrita [apok'rita]. Sub-order of insect ord *Hymenoptera*; contains all members of order except saw-flies.

Apocrypha. Writings of doubtful authenticity; of Old Testament, 1-441.

Apollima. Isl. of the Samoan group 6-494.

Apollo. Gk. god of song and music, son of Zeus and Leto, 1-183; and death of Achilles, 1-11; and Daphne, 3-49; and Hermes, 5-173; and the Muses, 5-299 illus.; oracle at Delphi, 3-69.

Apollo Belvedere. Famous statue in Vatican Museum; 1-183 illus.; 4-91.

Apollonius of Perga (c. 265-200 B.C.). Gk. mathematician of the Alexandrian school; and geometry of conic sections, 5-148.

Apollon, hero who fights with Christian in *Valgrim's Progress*, 2-127.

Apologia pro Vita Sua (1864). Cardinal Newman's reply to Kingsley's attack on him and on the Roman Catholic priesthood, 5-399.

Apoplexy, first aid for, 3-368.

Apoteia. Term applied to the men appointed by Jesus Christ to continue his work on earth, 1-184; St. Peter, 6-145.

AQUARIUS

Apostle spoon. Spoon bearing image of one of the Apostles; a set numbers 13, including one with figure of Jesus. Apostle jugs had relief figures of Apostles in 12 panels round them.

Apostolic Signatura. See Signatura.

Apostrophe, in punctuation, 6-309.

Apothecaries' Hall. Black Friars Lane, London, entrance, 4-526 illus.

Appalachians. Mt. system of N. America, 1-184, 5-452.

Appeal, Court of, in British system, 2-521; 4-53.

Appendix. Worm-like sac attached to lower right-hand end of large intestine; appendicitis is inflammation of appendix; and digestive system, 3-90.

Apperley, Charles James (1779-1843). Eng. sporting writer, known as "Nimrod"; wrote several works on foxhunting, 3-428.

Appert, François (1752-1811). Fr. chef; and food preservation, 2-212.

Ap'plan. Rom. historian, flourished during the reigns of Trajan and Hadrian.

Applan Way. Oldest and most famous of Rom. roads, Rome to Brundisium (Hridis) 360 m.; begun 312 B.C.

Apple. Fruit, 1-185; fruit and blossom 5-431 illus.; in market gardening 5-130; grafting, 3-479 illus.; cider 2-588; in botany, 2-24.

Appleby. Co. tn. of Westmorland, Eng. pop. 1,704 7-445.

Apple of Sodom. See Sodom, Apple of.

Appleton, Sir Edward (b. 1892). Brit. physicist; radar research, 6-337 and ionosphere, 6-344.

Appleton Layer. Ionized layer of upper atmosphere, above earth; reflects short-wave electromagnetic radiations used in sound broadcasting named after Sir E. Appleton, 6-337.

Applied mathematics, 5-149.

Applique lace, 4-132 illus. f.

Appomattox, Virginia, U.S.A.; scene of Gen. Lee's surrender, 4-474 illus. 475.

Apprenticeship. System of training young people for a skilled trade. In medieval times part of the guild system, master and apprentice being bound by indentures, usually for seven years, 4-103.

Approved schools, for juvenile delinquents; 6-506, 6-292.

Apricot. Fruit, 1-186, 3-482 illus.

April, fourth month of the year, 5-200.

April Fool's Day, 1-186.

Apsae. See Architectural Terms.

Apsaron. Promontory of Transcaucasia, extending for 40 m. on W. coast of Caspian Sea; forms extremity of Caucasus Mts.

Apsley House, Piccadilly, London residence of dukes of Wellington built (1778) for Lord Apsley by the Adam brothers; a museum from 1952; interior, 2-452 illus.; 6-300 7-137.

Apterygota (zool.). A sub-class of the class *Insecta*, including primitive wingless insects, 4-270.

Apteryx. The kiwi, 1-186; foot, 1-471 illus.

Apulia. Dist. of S. Italy; area 7,112 sq. m.; pop. 3,112,000. Industries mainly pastoral and agricultural 4-304.

Aqua Claudia. Roman aqueduct, 1-189.

Aquae Sextiae. Anc. name of Aix here Marius defeated Teutones (102 B.C.).

Aquae Sulis. Rom. name for Bath Somerset, as a place dedicated to Sul, a Brit. goddess, identified by Romans with Minerva. Founded as a spa c. A.D. 44; Rom. baths 1-38.

Aqua fortis. Name often given to nitric acid, 5-442.

Aqua Marcia. Roman aqueduct, 1-189.

Aquamarine. Semi-precious gemstone bluish-green, found in the Ural Mts. and Brazil.

Aqua regia. Mixture of nitric and hydrochloric acids which will attack gold or platinum, 1-12; 4-40; 6-29.

Aquarium, 1-187; for goldfish, 4-42.

Aquarius. Constellation between Capricornus and Pisces. The 11th sh.

AQUATIC

of the zodiac, represented as a water-bearer; 7-illus. 534.
Aquatic plants, 7-499-30 with illus.
Aquafort, Kind of etching, 3-300.
Aqueduct, 1-898, 6-446 illus., 7-424 illus., 7-425.
Aquila (species). See **Eagle**.
Aquilegia or **columbine**. Perennial herbaceous plant, family *Ranunculaceae*, native to N. hemisphere, height up to 2 ft. Flowers, various colours, May-July.
Aquileja [akwila'ya]. It. Tn. with pop. about 2,600; once one of chief cities of Rom. Empire with 400,000 pop.; destroyed by Attila A.D. 452.
Aquinas [a-kwi'-nas], Saint Thomas (1227-74), theologian and scholastic philosopher, called the "Angel Doctor"; next to St. Augustine in influence on Catholic doctrine ("Summa Theologiae," a summary of general knowledge as well as theology; 6-160).
Aquinum (Rom. tn.). See **Budapest**.
Aquigranum, anc. tn. See **Aachen**.
Aquitaine. Dist. of Fr. between the Pyrenees and the Garonne riv., formerly an old duchy. A possession of the Eng. crown for 300 yrs. after marriage of Eleanor of Aquitaine with Henry II in 1152.
Aquitania. Cunard White Star liner, 45,000 tons, launched 1913. Used as a troopship in both World Wars. Scrapped in 1950.
Arabesque [arabesk']. In music, a piece in decorative rather than emotionally expressive mood. See also **Architectural Terms**.
Araba and the **Arabs**. Country of W. Asia; area approx. 1,000,000 sq. m.; pop. est. 10,000,000, 1-190. See also **Arabs**.
Arabian desert, Africa, between Nile and Red Sea; distinct from the Arabian desert of Asia, 3-173.
Arabian Nights, 1-196, 2-354; Burton's translation, 2-133; The Story of Aladdin, 1-197.
Arabic language, dictionary, 3-88.
Arabic numerals, 5-475, 4-250.
Arabi Pasha (c. 1839-1911). Egyptian rebel; defeated by Wolseley (1882) at Tel-el-Kebir, 3-176.
Arab League. Formed March 22, 1945, between Egypt, Iraq, Lebanon, Transjordan (Jordan), Syria, Yemen, Saudi Arabia; aims, 1-195; 4-280.
Arabs, 1-190; in N. Africa, 1-53; conquest of Egypt, 3-175; 1-102; conquest of Palestine (635), 6-46; capture of Carthage (698), 2-255; influence and power in Middle Ages, 1-259; preservation of Gk. culture, 5-90; culture in Morocco, 5-265; the Koran, 4-425; medicine, 5-161; slave trade on Kenya coast, 4-399; growing independence in Algeria, 1-109; Lawrence and Arab revolt, 4-492; in Palestine, 4-302, 303, 6-48; coffee-drinking, 2-444; Arab child, 2-342 illus. See also **Arabia**.
Arachne. In Gk. myth., the clever weaver who rivalled Athena and was changed into a spider, 1-286, 7-133.
Arachnida. A class of the phylum *Arthropoda*, including spiders, scorpions and king crabs, 4-261; 7-133.
Arad, Rumania. Tn. on r. Maros; pop. 77,000; formerly strong fortress; one of world's largest distilleries.
Arafat, Mt. Holy mt. near Mecca. In Mahomedan legend it was scene of reunion between Adam and Eve after their fall from Paradise, 5-165.
Arago, Dominique (1786-1853). Fr. astronomer and physicist; founder of electro-dynamics.
Aragon. One of the two kingdoms into which Spain was divided before the union of 1479.
Araguaya. Tributary of the Amazon, 1,300 m. long, 1-199.
Arakan. W. coast area of Burma, from s. of Chittagong (just inside S. Bengal border) to Ramree Is.; cap. Akyab; overrun by the Japs April 1942; in Maungdaw-Buthidaung areas Brit. and Indian forces prevented Jap. breakthrough to India.
Aral Sea. Inland sea of Cent. Asia, 1-201; fed by Amu-Daria, 1-266.

Aram, Eugene (1704-59). Eng. schoolmaster hanged for murder; subject of novel by Bulwer-Lytton and poem by Hood.
Arameans. An anc. branch of Semites centred in S. Syria and Iraq.
Aramaic, Semitic language; speech of Jews, 4-151.
Aran, Isles of. Off Galway, Ireland. Three islands with a total area of 18 sq. m. Pop. about 2,680. Archaeological remains.
Aran Benllyn. Mt. in Merionethshire, Wales, 2,901 ft., 5-175.
Aran Mawddwy. Mt. in Merionethshire, Wales, 2,970 ft., 5-175.
Aran Mtn., Merionethshire, Wales, 5-175.
Aranyakas. Hindu poems on the holy life, 4-250.
Ararat. Double volcano mt. peak in E. Armenia; legendary resting place of Noah's ark, 1-242; 5-445.
Araucanian Indians. Tribe of S. Amer. Indians, 2-359, 7-98.
Arbalet. See **Crossbow**.
Arbela. Modern Erbil or Arbil, tn. in Iraq N.E. of Mosul; battle of (331 B.C.), 1-99.
Arbitrage. See **Stock Exchange Terms**.
Arbitration. Settlement of disputes by neutral referees, between nations and individuals, and in industry; Hague court, 4-116.
Arbor Day. Day set apart in U.S.A. for planting trees; it is an unofficial holiday, also observed in some places in Eng. and in other countries.
Arbroath or **Aberbrothock**. Borough and spt. of Angus, Scot. Holiday resort and shipping centre; pop. 19,503.
Arbutus. Evergreen shrub, 1-201.
Arc. In electricity, a luminous discharge of current through an ionised gas, as in arc lamps, 2-219; welding, 7-436; furnace, 4-174. In navigation, 5-340. A geometrical arc is a portion of a circle, or of any other conic section such as a parabola, hyperbola, or ellipse.
Arcade. See **Architectural Terms**.
Arcadia. Country of anc. Greece, in centre of Peloponnesus, 1-201.
Arcadian dialect, of anc. Greece, 4-71.
Arcadian stag. In Gk. myth., captured by Hercules, 4-166.
Arcadius (395-408). Byzantine emperor, 4-77.
Arc de Triomphe, Paris, 6-79, 5-323, 6-85 illus.
Arch. In architecture, 1-201; in Rom. architecture, 1-209; of Severus, 6-127 illus.; arched bridges, 2-64.
Archean period, in geology, 3-515.
Archaeology. The science which studies the relics of Man's handiwork, such as buildings and utensils, 1-203, 5-104; school at Athens 1-290; Egyptology, 3-183; excavations at Pompeii, 6-257; and the great flood, 5-445.
Archaeopteryx. A prehistoric bird, known through fossil remains, 6-282, 1-453 illus.
Archaeozoic period, in geology, 3-515.
Archangel. Rus. spt. on r. Dvina near White Sea; pop. 281,000.
Archbishop. In Church of England, 2-386, 7-515.
Archdeacon, in Church of England, 2-387.
Arched dam, type of dam, 3-29.
Archer, Frederick James. (1857-86). Eng. jockey. Rode in 8,084 races and won 2,748. Won five Derbys, six St. Legers, four Oaks, and five Two Thousand Guineas.
Archery. Art of shooting with bows and arrows, 1-206; in Eng. army, 1-247 with illus.; and bows, 2-29.
Archimedean screw, 1-208 with illus.
Archimedes (c. 287-212 B.C.). Greek mathematician and scientist, 1-207; and specific gravity, 6-180; and calculation of π , 5-170.
Architect, scope of work in building construction, 2-112.
Architecture, 1-209; Aegean, 1-24 illus.; Aztec, 1-334 illus.; Egyptian, 3-185-191 illus.; Gk. orders, 6-531 illus., 532; Indian native, 4-246, 247 illus.; cathedrals, 2-264;

ARGONAUT

Norman castles, 2-256; Mahomedan, 5-89; Spanish, 7-112; Moorish, 7-115 illus.; Red Indian, 6-371 illus.; Renaissance, 6-366 with illus.; Fr. Renaissance, 6-387; Adam style, 1-14; Regency style, 5-324, 2-70, 72 illus.; Georgian, 1-383 illus.; skyscrapers, 5-412; Le Corbusier, 4-473, as a critic, 2-232; see also **Arch**; **Building Construction**; **Castle**; **Cathedral**; **Orders of Architecture**.
Architecture, Orders of. See **Orders of Architecture**.
Architrave. See **Architectural Terms**.
Archil etc. See **Architectural Terms**.
Archons. Nine elected officials of anc. Athens sharing supervision of religion, war-burials, aliens and law.
Arco. Anc. city of N. Italy, 4-309 illus.
Arcoet, battle of (1751). India; (Clive's victory over Fr., 2-411, 4-252).
Arctic Circle, 1-220, 4-453.
Arctic Ocean, Islands, 1-220; area, 5-191.
Arctic Regions, 1-220; polar exploration, 6-212; Midnight sun, 5-200, with illus. f.; weather compared with Antarctic, 1-161.
Arcturus. Chief star in the constellation Bootes, and brightest star in the northern sky, 7-116.
Ardea (species). See **Heron**.
Arden, Forest of. Wooded dist. of Warwickshire, Eng. once a much larger forest. Shakspeare knew the forest well, and woodland scenes, set in Arden, appear in *A. You Like It*.
Ardennes. Wooded plateau and hills in S.E. Belgium, Luxembourg and northern France, 1-222, 7-49n.
"Ardil". Fibre resembling wool, made from protein of ground-nuts, 6-369.
Ardnamurchan Point. Westernmost point of the mainland of Gt. Brit., in Argyllshire, Scot. It has a lighthouse.
Ardrossan. Scot. spt., Ayrshire; fishing, engineering works, pop. 8,799.
Areca nut. See **Betel**.
Arena of Nimes, Fr. One of the finest Rom. ruins in existence; 437 ft. long by 332 ft. wide.
Arenig Fawr. Mt. in Merionethshire, Wales, 2,800 ft., 5-175.
Areopagitica. Pamphlet by Milton in defence of the freedom of the Press, 5-210, 3-286.
Areopagus. Sacred hill of Athens, named after Ares, god of war, 5-136.
Aioquipa. City of Peru, cap. of Arequipa dept., pop. 97,110; industries, 6-111.
Ares. In Gk. myth., god of war, identified with Rom. god Mars, 5-136.
Arezzo (aret'so). It. city; pop. 60,200; 13th cent. cath.; art treasures; birthplace of Guido, Petrarch; anc. Aretium, one of 12 great cities of Etruria. Heavily damaged during 2nd World War.
Argall. Wild sheep native to Altai mts. and Siberian steppes. About the size of a small donkey, 7-20.
Argand, Aimé (1755-1803). Swiss chemist and mathematician; invented Argand smokeless gas burner; improved oil lamp, 4-443.
Argentina. Republic of S. Amer.; pop. 16,105,244; cap. Buenos Aires, 1-223; claim to Falkland Isl. Dependencies, 1-170, 3-338; flag, 3-385 illus. f.
Argentarium. Rom. tn., modern Strasbourg.
Argives. Inhabitants of Argos in anc. Greece. Homer used the term for Greeks in general.
Argo. The ship of the Argonauts, 1-226.
Argol. A tartrate in wine lees, 7-228.
Argolls. Anc. Gk. dist. in N.E. Peloponnesus.
Argon (A). A colourless element of the inert gas group; atomic weight, 39.94; atomic no. 18; 3-224; discovery by Rayleigh and Ramsey, 6-363; in air, 1-79, 81.
Argonaut or **Paper Nautilus**. A sea mollusc, 1-227.

TERMS USED IN ARCHITECTURE AND BUILDING

Atrium. A recess of considerable size in a room.

Apse. A semicircular space opposite the entrance of a basilica.

Arabesque. A form of ornamentation highly developed during the Roman and Renaissance periods, of a fanciful character. The name means Arabian, but true Arabian ornamentation is called *Moresque*.

Arcade. A series of open arches supporting a roof or an upper story, also a long gallery that is arched and has shops on either side, sometimes a narrow street that is covered over.

Architrave. The lowest part of an entablature, resting on the capital of the column. Also the moulding round a door or window.

Archivolt. Band of mouldings, etc., carried around a curved opening.

Arris. Corner where two planes meet.

Ashlar. Squared or dressed blocks of stone.

Basilica. Originally a hall of justice among the Greeks and Romans. In the early days of Christianity churches were given the same general plan which was that of an oblong building with a nave, aisles, apse, and sometimes a transept.

Batten. A narrow strip of wood.

Batter. Slope of a wall face as it diminishes in thickness with increase in height.

Bay. An offset in a wall, as one of the compartments between pilasters or pillars, also part of a room forming a recess, a window opening with its framing.

Beam. A horizontal supporting member of timber, steel or concrete, resting on two or more supports.

Bevel. Finished surface at an angle other than a right angle. When a sharp corner is cut off, it leaves a flat surface called the bevel. When a corner is bevelled off equally in removing the arris, it induces a chamfer.

Bond. In a wall of stone, brick or similar units, the arrangement of the units to break joint and afford strength, also the pattern produced on the face of the wall by this arrangement.

Bracket. A projecting member supporting an overhanging weight, often an ornamental member to carry a statue or similar object.

Bridging. (1) Cross pieces between joists or studs to act as stiffeners.

Butt joint. The joint formed by placing two members end to end.

Buttress. A brickwork or masonry mass which projects beyond a wall to take its thrust. When detached from the wall at the foot and arched over, it is termed a flying buttress.

Caisson. A watertight enclosure or casing sunk into the ground to allow work on the foundations of a building.

Capital. The ornamental head to a column. It identifies the order to which the column belongs.

Casement. A window which opens on hinges or pivots.

Clerestory. A part of a building that rises above and clear of other parts of the roof, it contains windows for lighting the interior. Originally that part of a church above the roofing of the aisles by means of which the upper part of the nave was lighted.

Conduit. A channel or pipe to carry water. The pipe or casing through which electric wires are run.

Coping. The cap run continuously around the top of a wall.

Corbel. A support projecting from a wall; courses set beyond the lower ones in brickwork or masonry form corbel courses.

Cove. A surface that is continuously concave. A quarter-circular hollow moulding.

Damp-course. Horizontal or vertical layer of some moisture-interrupting material built into walls.

Dormer. A vertical-framed window in a sloping roof, a structure projecting from a roof having a window in it.

Dowel. A pin of wood or metal let into two parts or members to hold them together.

Drip. The grooved underside of a sill or moulding or other part that projects. The groove causes rain to drip instead of running back to the wall. Also the step in a lead gutter or lead flat where sheets overlap.

Elevation. Side or end view of an object, or a representation on a perpendicular plane.

Facade. The front of a building especially its principal front.

Fan-light. Originally a fan-shaped window in the head of a door or window. Now applied to rectangular lights in that position, often hinged or pivoted to open for ventilation.

Finial. The decorative piece frequently in the form of a knot or bunch of foliage, which finishes off a pinnacle or gable.

Furring. Strips of wood on the inside of a brick stone or concrete wall to give a level surface for boarding, etc.

Flashing. Metal placed at joints between walls and roof to prevent water entering.

Flat. Suite of rooms on a single floor in a building of two or more stories.

Flue. A passage to carry off air, smoke or gas.

Fluting. Channels which are cut on the shafts of columns. Each channel is a flute.

Footings. Courses of brickwork or masonry resting on the foundations, made wider than the walls in order to give greater bearing.

Foundations. Lowest part of a structure that transmits the weight of a building to the ground on which it is built. Usually of concrete made wide so as to spread the load over a greater area. (See *Grillage*).

Frame. A structural member built up of ties and struts in a series of triangles. (See *Truss*).

Framing. The timber or steelwork skeleton of a building.

Fresco. A decoration in water colour on fresh plaster.

Frieze. An entablature has three divisions, and the frieze is the middle one. It is sometimes ornamented. Top part of a wall above the picture rail.

Girder. Any main horizontal member which supports the floor beams or a partition. Similar principal member of a bridge.

Grillage. A mattress of steel beams bolted together usually in two layers with the beams of each at right angles to the other, used as a foundation in bad ground.

Grille. A screen of wood or metal especially of wrought iron in an ornamental design used in arches, fences, etc.

Half-timber Work. Method of construction in which the walls are of timber frames having the openings filled in with brickwork.

Head. The upper horizontal member of a door or window opening.

Header. The end or short face of a brick as it shows in the face of a wall.

Jamb. Vertical sides of a door or window opening, etc.

Joist. A horizontal timber or steel beam to carry a floor, ceiling, or roof.

Lintel. Horizontal member of timber, stone, etc. spanning an opening.

Metope. In the Doric frieze the spaces between the triglyphs are called metopes. In the Parthenon they were sculptured.

Mitre. A joint in which the members are cut at an angle and butted together.

Mortise. An opening or pocket cut in a member to take the tenon of a mortise-and-tenon joint.

Mullion. The upright posts or dividers in window openings.

Muntin. Vertical members between panels of a door. The outside vertical members are "stiles"; the horizontal ones, "rails".

Nave. The central part of a church or cathedral from the entrance to the altar. The nave is usually lighted from above by the windows in the clerestory.

Newel-post. Central post in a winding stair case, supporting inner ends of the steps, post carrying the handrail.

Nosing. A rounded edge which projects as on a stair tread.

Oriel. A projecting window of polygonal or semi-cylindrical form and divided by mullions and transoms into different bays and other proportions.

Pier. A post or pillar used to sustain a beam, may be detached (or separate) or may be attached (built into a wall). (See *Pilaster*).

Pilaster. A pier of rectangular shape usually set in the wall of a building with a projection of about one third its width. Frequently treated to give the appearance of a column.

Plate. A horizontal timber used as a bearing, a wall plate.

Rail. A member placed horizontally as in a door, a fence, panelling, etc.

Rebate. A recess cut or formed in the edge of a member to take a frame, etc.

Return. A structural member that turns and ends against a surface.

Reveal. The sides of a door or window opening at right angles to the face of a wall.

Ridge. The member which extends along the top of a roof and to which the top ends of the rafters are fastened.

Riser. The upright piece in a stair step.

Rose window. Any circular window that is decorated with tracery. Also called wheel window.

Sash. The frame holding the glass in a window.

Sill. A principal member placed horizontally under a structure for a beam, at the bottom of a frame, also the horizontal piece at the bottom of a door or window opening.

Sleeper. A horizontal timber for the support of floor joists or other timbers. A sleeper wall is a low wall to take ground floor joists.

Soffit. The under surface of a structure, such as in arch or cornice, a stairway, a vault.

Stile. A member placed vertically in panelling as a stile on a door. The inner verticals are termed muntins.

Stop. The small strip that holds a window or door in place.

Strether. The longest face of a brick.

Strut. A member used in compression in a building, that is, one that sustains a pressure. It is usually a diagonal member. (See *Frame*).

Stud. One of the vertical members of a frame (e.g. in a timber partition).

Tie. A building unit which holds other members in tension being the opposite to a strut. (See *Frame*).

Transept. The lateral parts of a church, between the nave and the choir which extend beyond the walls of the structure giving it the form of a cross.

Transom. Beam or bar of wood, stone or metal laid horizontally across a door or window.

Tread. The horizontal member on which the foot rests in a stair step.

Trim. The woodwork or metalwork used for the interior finish of a room.

Trimmer. A timber at the side of a framed (or trimmed) opening that butts into and is supported by a trimming joist. The trimmer carries the ends of trimmed or "tail" joists, as it is a fireplace opening.

Truss. A framework of timbers or steel, braced to resist the strains of pressure and pull, as a roof-truss. In its simplest form the rafters, king-post and tie beam of a house roof. (See *Frame*).

ARGONAUTS

Argonauts. Gk. heroes who captured the Golden Fleece, 1-226; and Theseus, 7-269.

Argonne. Wooded region in N.E. France, in 1st World War, 7-483.

Argos, Greece. Anc. city 20 m. S. of Corinth.

Argosy. Originally, merchant ship of Rugosa (Argouse); now, poetically any richly laden vessel.

Argus. In Gk. myth., a monster with 100 eyes of which only two slept at a time.

Argus. In the *Odyssey*, the faithful dog of Odysseus, 5-503.

Argyll, John Douglas Sutherland Campbell, 9th Duke of (1845-1911). Gov.-gen. of Canada (1878-83); long known as Marquess of Lorne; married Princess Louise, daughter of Queen Victoria.

Argyllshire. Second largest Scottish co.; area 3,110 sq. m.; pop. 63,270; co. in Inventory, 1-247.

Aria. In opera, 5-513 *See also Musical Terms* (table).

Ariadne [ar'ad'nē]. In Gk. myth., daughter of Minos, king of Crete; helped Theseus to find his way out of the Minotaur's labyrinth, 7-268. Deserted by him on Naxos, she was found and married by Dionysus.

Arianism. The doctrine, repudiated by early Christian Church as heresy that the Son is finite and created by the Father; founded by Arius 1-101.

Arica [ar'kal]. Spt. in N. Chile; pop. 13,100; large trade with Bolivia.

Ariel. Fairy spirit; chief servant of Prospero, in Shakespeare's *The Tempest*, 7-256.

Aries [ar'ēz] or **Ram.** Sign of the Zodiac, 7-524 illus.

Arion [ar'ion]. In Gk. myth., poet-musician, who saved his life, when forced to jump into the sea, by charming the dolphins with song.

Ariosto [ar'io-tō]. Ludovico (1471-1533). Ital. epic poet; *Orlando Furioso*, 4-329; portrait, 4-330.

Aristides [ar'is-tīdēz] (c. 550-467 B.C.). Athenian soldier, 1-227.

Aristippus (c. 430-360 B.C.). (Gk. philosopher, pupil of Socrates, 8-160.

Aristophanes (c. 445-385 B.C.). Athenian comic dramatist, 1-227, 3-116.

Aristotle (384-322 B.C.). Gk. philosopher, 1-228; work and influence, 4-91; treatise on rhetoric, 6-390; and medicine, 5-161, 1-113; on philosophy, 6-158; theory of atoms, 1-299; and four elements, 1-95. as pupil of Plato, 6-222; as zoologist, 7-326; and Alexander the Great, 1-98.

Arita ware (Jap. pottery). *See* Hizen ware.

Arithmetic. 1-237; addition, 1-16; division, 3-96; factors, 3-335; fractions, 3-428; multiplication, 5-203; percentage and interest, 6-122; subtraction, 7-177. Symbols *see* Algebra.

Arithmetical progression. 6-532.

Arius (256-336). Alexandrian theologian, founder of Arianism, 1-101.

Arizona. 48th state of the U.S.A. Area 113,910 sq. m.; pop. 749,587 (inc. 55,000 Indians); cap. Phoenix, 1-238; Grand Canyon, 4-60.

Arizonaite. an ore of titanium, 7-282.

Arkaig, Loch. Fresh-water loch Inverness-shire, Scot., 4-275.

Arkansas (pron. ark'an-saw). State of the U.S.A. Area 53,100 sq. m.; pop. 1,900,000 (one quarter are Negroes); cap. Little Rock, 1-239.

Arkansas River. Largest Mississippi affluent except Missouri; rises in Rocky Mts., flows S.E. 2,000 m., 1-230.

Ark of the Covenant. Chest containing the laws given to Moses on Mount Sinai.

Ark Royal, H.M.S. Lord Howard's flagship, 3-277 illus. The 2nd Ark Royal (1914) was a seaplane carrier. The 3rd, an aircraft carrier was completed 1938, torpedoed 1941. The 4th, also an aircraft carrier was launched in 1950.

Arkwright, Sir Richard (1732-92). inventor of the spinning frame, 1-239, 7-136; machine compared with spinning jenny, 4-132.

Aries [ar'ē]. Fr. Important tn. in Roman times, anc. Arclate; remains of huge Rom. amphitheatre; pop. 32,400; on Rhône riv., 6-396.

Arlington, Virginia, U.S.A. VII. on Potomac r.; national cemetery and burial place of America's unknown soldier who fell in the 1st World War. Arm, bandage for fracture, 3-366 illus.

Armada, The Spanish (1588), 1-240 and naval warfare, 5-351; superiority of Eng. ships, 7-29; decline of Sp. power after defeat, 1-135; Elizabeth 1 and, 3-231; beacon signals, 7-31.

Armadillo. Armour-clad burrowing animal, 1-241; foot, 3-413 illus.

Armageddon [ah-mag'ed-don]. Battle-field mentioned in Rev. xvi, 16, where final struggle between good and evil is to occur on Judgment Day; hence any great battle; supposed site in Palestine, 1-112.

Armagh. Co. and town, Northern Ireland; pop. (town) 9,000; (co.) 114,000; area 189 sq. m., 1-242.

Armat, Thomas (1867-1948). Amer. inventor of the Vitascoper, an early cinematograph projector, 2-392.

Armature. In electrical engineering, that part of a machine which carries the winding connected to the external supply and in which the principal e.m.f. is induced. The term is usually limited to the rotating part of a D.C. machine. In magnetism: (a) a body made of ferromagnetic material arranged in such a way as to be displaced by the magnetic action of an electromagnet; (b) a piece of ferro-magnetic material placed against the ends of a permanent magnet as a keeper; in dynamos, 3-113 with illus.; in electric motor, 5-275.

Armenia. Country, south of the Caucasus mts., now divided between Turkey, Persia and Russia, 1-242.

Armenia. Smallest republic of the U.S.S.R.; area 11,640 sq. m.; pop. 1,300,000; cap. Yerevan, 1-243; 6-477.

Armentières [ahrmehnt'ēer]. Fr. mtg. and border tn. on r. Lys; pop. 21,000; in 1st World War was Allied anchor to S. flank of Ypres salient until captured by Germans in April 1918.

Arminianism. A doctrine of modified predestination, making salvation depend on acts of individuals; formulated by Jacob Arminius (Dutch, Harmensen) (1560-1609) anti-Calvinist theologian.

Arminius the Cheruscan. *See* Hermann.

Armistice. A cessation of hostilities; and 1st World War, 7-483.

Armistice Day. Day of remembrance observed on Nov. 11, between two World Wars, 6-383 *See* Remembrance Day.

Armorian tribes. in Brittany 2-91.

Armour, Jean (1767-1834). Wife of Robert Burns 2-132.

Armour, 1-243.

Armour plate. discovered from meteorite composition, 5-181.

Arms (weapons). *See* Anti-aircraft Artillery; Archery; Artillery; Armour; Army; Bomb; Explosives; Firearms; Flying Bomb; Guided Missiles; Machine-gun; Mines in Warfare; Navy; Rocket.

Arms. in heraldry, 4-165.

Arms, College of. *See* College of Arms.

Armstrong, William George Armstrong Baron (1810-1900). Brit. solicitor and engineer; invented the hydraulic crane and other mechanical appliances; also the Armstrong gun; founder of important ordnance and shipbuilding works at Elswick Northumberland.

Army. 1-245; cadets, 2-158 drums 3-128 illus.; personal armour 1-243 244; regimental colours 2-465; rocket brigades, 6-421 Rom. legion 4-475.

ARSENAL

Army Air Corps. Brit. army unit (1942-47) comprised the Glider Pilot Regt., the Parachute Regt., and Airborne Infantry Units, 1-252.

Army Cadet Force (Brit.). Pre-service Army training organization for boys of 14 to 18 yrs., 2-154.

Army Corps. Division of an army, first introduced by Napoleon, its composition varies, but usually it consists of about 10,000 officers and men.

Army Council. Controlling body of Brit. Army, 1-253.

Arne, Thomas Augustine (1710-78). Brit. musical composer, works include oratorios, operas, operettas; best known for his "Rule, Britannia" in *The Masque of Alfred*; and Brit. national anthem, 5-326.

Arnhem. Tn. in Netherlands on riv. Rhine; pop. 103,317, 5-370.

Arnhem, Battle of, 1-253, 7-195.

Arnica. A genus of flowering plants of family Compositae, found in N. Europe and W. part of U.S.A.; tincture a home-chole remedy for sprains and bruises.

Arno. R. of It., rises in Apennines, flows 150 m. to Mediterranean, through Florence and Pisa, 4-301.

Arnold, Matthew (1822-88). Eng. poet and critic; son of Thomas Arnold; 1-251, 3-291.

Arnold, Thomas (1795-1842). Headmaster of Rugby School and educational reformer, 1-254; influence on education, 6-503, 3-166.

Arnold of Brescia [bresh'a] (c. 1100-55). It. priest and reformer; preached against vices and riches of clergy; led revolt against papal rule in Rome; executed at instigation of Adrian IV.

Aromatic compounds. in chemistry, 2-319, 321 diag.

Aromatic oils. give flavour to spices, 7-132.

Arosa. Noted health resort in canton Grisons, Switzerland; nearly 6,000 ft. high; pop. 1,800.

Arpeggio. *See* Musical Terms (table).

Arquebus. An early hand gun, 3-357, 358 illus.

Arrack. Alcoholic drink made in India and Far East, distilled from palm toddy. Jap. variety is called saké.

Arran. Isl. of Buteshire, Scot., noted for igneous rocks and beautiful scenery; largest Isl. in Firth of Clyde (165 sq. m.); pop. 4,500; 2-134.

Arran Banner. Variety of potato, 6-273.

Arran Pilot. Variety of early potato, 6-273.

Arras [ar'ah]. City in N. France cap. of dept. of Pas-de-Calais on r. Scarpe; pop. 26,000; strategic point in 1st World War, when ancient town hall and cath. were destroyed; in Second World War, Brit. h.q. of 1939-40, liberated, 7-495.

Arras. General term for tapestry, 7-226.

Arrhenius [ar'ah-nēus], **Svante** (1859-1927). Swedish chemist and physicist; originator of the ionic theory of electrolytes; Nobel prize-winner (1903); advocate of theory that the energy of the world is self-renewing.

Arria. *See* Architectural Terms.

Arrol, Sir William (1839-1913). Brit. engineer, contractor and politician; head of firm which built the Tay, Forth and Tower Bridges and Manchester Ship Canal.

Arromanches. Fr. vill. in dept. of Calvados, Normandy, 7 m. N.E. of Bayeux; Mulberry Harbours, 5-292.

Arrow. In archery, 1-207.

Arrow. Riv. of Herefordshire, Eng., 4-168.

Arrowhead. Plant, 2-24 illus. f., 7-430 with illus.

Arrowroot. Starchy powder obtained from roots of W. indies and trop. Amer. plants; an invalid food, name comes from S. Amer. Indian use for wounds made by poisoned arrows.

Arsenal. Place for manufacture or storage of armaments; Chortley (Lancs.) supplements Woolwich as principle. Royal Arsenal

ARSENAL

Arsenal. Famous Association football club with h.q. at Highbury, London; First Division champions in 1931, 1932-35 1938, 1948, 1953.

Arsenic (As). A highly poisonous element of the nitrogen group; atomic weight, 74.91; occurs chiefly as sulphides; does not melt but volatilizes at 212° F.; used in mfr. of lead shot, rat poisons, insecticides, etc.; 3 224; and antidote, 6-236.

Art. See **Fine Arts**. For careers in **Art** see **Commercial Art**.

Artaxerxes or **Artaxerxes**, the **Sassanian**. King of Persia (3rd cent. A.D.); and revival of Persian rule, 6-131.

Artaxerxes I. King of Persia, son of Xerxes I, ruled 465-424 B.C.

Artaxerxes II. King of Persia 404-358 B.C., succeeding his father Darius II; life told by Plutarch.

Artaxerxes III. King of Persia 358-338 B.C.; weak and despotic ruler.

Artemis. Gk. goddess of hunting; identified with Rom. Diana; there were other goddesses called Artemis, of a different character, 3 86; and Iphigenia, 1 67.

Artemisium. Region on S. coast of Euboea, Isl. in Aegean Sea; naval victory of Gks. over Persians, 480 B.C.

Arterial blood, and oxyhaemoglobin, 1 489.

Arteries. Blood vessels; heart and circulatory system, 4 113; in early medical theory, 1-492.

Artesian Well, 1 264; 7-139.

Artevelde [artevel'de]. Jacob Van (c. 1200-1315). Flemish leader in revolt of Ghent (1337) against Count of Flanders. His son Philip (1340-82) was killed in similar revolt.

Arthropoda. The phylum to which insects, crustaceans, myriapods, and arachnids belong, 4 264, 1 154.

Arthur (1187-1203). Duke of Brittany, grandson of Henry II of Eng.; had rival claim to King John's throne; was supported by nobles in France; captured and murdered by John's orders, 4 478.

Arthur. King of Brit. in 6th cent.; hero of many legends, 1-266; and the Round Table, 6-456; Malory and *Morte d'Arthur*, 5 97; connections with Cornwall 2-508.

Arthur's Chair (mt.). See **Pen y Fan**.

Arthur's Seat. Hill overlooking Edinburgh from S. (822 ft.).

Artibonite. Largest riv. of Haiti, 4 118.

Artichoke. A vegetable, 1 257.

Articulated locomotives, types of, 5-8, 6.

Artifacts. Term for anc. stone weapons, tools, etc., 1 205.

Artificial lightning, in experiments in grid system, 4 505.

Artificial pearls, 6-103.

Artificial respiration, two methods explained, 3 367 with illus.; in swimming, 7-210.

Artillery, 1 256; anti-aircraft, 1 171; Brit. army formations, 1 250; naval, 5-353, 354, 355 illus. See also **Firearms**; **Machine-gun**.

Artiodactyla. Order of mammals with cloven hoofs, 5-103.

Artois [ahrtwah]. Former province in N. France, cap. Arras; now department of Pas-de-Calais; desperate fighting in First World War (Cambrai, Loos, Neuve Chapelle); gives name to artesian well, 1-255.

Art paper, china clay in, 6 71.

Arts, **Royal Society of**. Institution whose functions are indicated by its full title, Royal Society for the Encouragement of Arts, Manufactures and Commerce. Founded in 1754.

Arts Council of Great Britain, formed early in 2nd World War to encourage knowledge and practice of the arts: C.E.M.A. (Committee for Encouragement of Music and the Arts) provided plays, concerts and art exhibitions for forces, war workers, and general public; given permanent form June 1945; govt.-controlled.

Aru Islands. Group in Indonesia, s.w. of New Guinea; pop. 18,000.

Arum. Brit. perennial, tuberous-rooted wild plant, known also as wake-robin, cuckoo-pint, lords and ladies; pollination, 8-399.

Arum lily. Flower, native of S. Africa, 4-507.

Arun. R. of Eng.; flows in St. Leonard's Forest and flows through Sussex into the Eng. Channel at Littlehampton. Arundel Castle overlooks it, 7-196.

Arundel. Anc. tyn. of Sussex on r. Arun; pop. 2,680; the 10th cent. castle, destroyed during Civil War and rebuilt towards end of the 18th cent., is the seat of Duke of Norfolk.

Arundel Marbles. Collection of antiquities bequeathed in 1887 by 6th Duke of Norfolk to Oxford Univ.

Aruwimi [ardwim'e]. Tributary of r. Congo; rises w. of Lake Albert, flows w. 800 m. through jungles of equatorial Africa; partly explored by Stanley (1887); 2-480, 481 map.

Arve, riv., tributary of the Rhône, 6-396.

Aryan. Language group, 1 261.

Aryans. Tribes who invaded India from the n.w. about 2000 B.C.; society and civilization, 4-251, 5 203.

Asa. Third king of Judah, zealous uprooter of idolatry (1 Kings xv. 2 (Chron. xiv-xv)).

Asafoetida [asaf'etida]. A resin, with smell of garlic.

Asaph [asaf]. Leader of David's temple choir. The hereditary choirs of the temple were called "sons of Asaph" (1 Chron. xxv).

Asbestos. A fibrous mineral used in fireproof fabrics, 1 262.

Aescanius. In Rom. myth., son of Aeneas, Trojan hero, 1 25.

Aescension. Isolated Brit. isl. near middle of S. Atlantic Ocean; 34 sq. m.; govt. sanatorium; noted for large turtles.

Aescension, The, in the story of Jesus, 4 488.

Ascham [ask'am], Roger (1515-68). Eng. classical scholar and writer; tutor of Queen Elizabeth I; noted for defence of gentle methods of teaching, in *The Schoolmaster* (1570); famous treatise on archery, *Trophiulus* (1515).

Asche, Oscar (1872-1936). Brit. actor-manager; b. in Australia; first appeared in London 1894; presented *Cu Chin Chin*.

Aesclepiades. A guild of Gk. physicians, 1-15.

Aesclepios. See **Aesculapius**.

Ascomycetes. A class of fungi, 3-189.

Ascorbic acid. Hexuronic acid or Vitamin C; present in most fresh fruits, salads and lightly cooked vegetables, 7 401.

Ascot. Vill. of Berkshire; fashionable horse-racing meeting, 4 198, 199.

Asdic (Anti- or Admiralty Submarine Detection Investigation Committee). R.N. method of detection of submarines by means of sound waves (or echoes) thrown back by the submarine's hull, 5-349.

Asepsis, in medicine, 5 165.

Aseptic surgery, 5 165, 7 194.

Asgard. In Norse myth., city of the gods, 5 500.

Ash. Deciduous tree, 1 263 7-312 illus.; 314 illus.

Ashanti [ashant'i]. Inland territory in Gold Coast Colony, Brit. W. Africa; cap. Kumasi.

Ashburton. Town of Devon, 24 m. N. of Plymouth. Grammar school dates from 1314.

Ashburton. A variety of marble, 5-121 illus. f.

Ashburton Challenge Shield. Trophy competed for annually at Bideley, Surrey, by teams of eight from the public schools' junior training corps, 7-12.

Ashby-de-la-Zouch. Tn. Leics., Eng; pop. 6,106, 4-476.

Ashdod. Anc. Philistine city in Palestine, 6-157.

Ashdown Forest. In Sussex; the only remaining part of the immense forest known to the Saxons as the Andredswald.

ASSAM

Asher (Hebrew "blessed"). Son of Jacob; ancestor of tribe of Asher.

Ashes, The. In cricket, 2-531.

Ashkelon. Anc. Philistine city in Palestine, 6-157.

Ashkhabad. Cap. of Russ. republic of Turkmenistan, formerly Poltoransk; pop. 127,000; a commercial centre.

Ashlar. In architecture. hewn and squared blocks of stone.

Ashmole, Elias (1817-92). Eng. astrologer and antiquary; founder of Ashmolean Museum, Oxford, 2-454. 5-299, diary, 3-86.

Ashmolean Museum. Oxford, 5-299, 6-20.

Ashridge. Name of park and house in Herts, former seat of Lord Brownlow; mansion now a Conservative college founded as a memorial to Bonar Law.

Ashton, Frederick, W. M., C.B.E. (b. 1906). Brit. choreographer and dancer; created "Façade," "Les Patineurs," "Symphonic Variations."

Ashton-in-Makerfield. Tn. in Lancs., Eng.; coal mines and cotton mills; mfrs. incl. locks, nuts, hinges, files, and nails; pop. 19,033.

Ashton-under-Lyne. Mig. tn., Lan. cashire; pop. 46,490; silk, cotton, bleaching, dyeing, hat, iron-founding industries; coal mines near by.

Ashthorpe. See **Astare**.

Ashurbanipal. See **Assurbanipal**.

Ash Wednesday. First day of Lent. Name originated in primitive church custom of strewing ashes on heads of penitents, dressed in sackcloth, before expelling them from communion until Maundy Thursday.

Asia. Largest of the continents; area about 17,300,000 sq. m.; pop. about 1,500,000,000; 1 264; map f. 1-268, 269; origin of name, 1-270; N. Amer. land-bridge theory 1-90; population distribution 1-268; products and resources 1 272; importance of rice crop 6 397. See also chief physical features, countries and cities.

Asia, co. It. tn., centre of small plateau dist. S.E. of former Austrian Tiro-tino; pop. 3,051.

Asia Minor. Peninsula forming the w. extremity of Asia; area about 280,000 sq. m.; pop. 17,300,000 1 274, 7 332.

Askari. Native E. African soldier trained and officered by Europeans.

Asmara. Cap. of Eritrea; pop. 117,000; 3 295.

Asoka. Emperor of India 261-228 B.C.; great conqueror, who, horrified by war, devoted himself to spreading Buddhist religion. His edicts and moral doctrines were inscribed on rocks and pillars, 4 251.

Asp. Snake, 2 436.

Asparagus. Perennial plant, 1 274.

Aspasia. Wife of Pericles, Athenian statesman of 5th cent. B.C.

Aspect Ratio. See **Aeronautics** (table).

Aspen. Deciduous tree, up to 100 ft. Native to Europe, N. Asia, N. Africa; tooth-edged leaves, whitish beneath, on long stalks, are moved by slightest breeze, whence saying, "shake like an aspen."

Aspern, Austria. Vill. on Danube opposite Vienna; here French were defeated by Austrians in 1809.

Asphalt, 1-274; and Trinidad, 7-317.

Asphaltites, Lake (classical name) See **Dead Sea**.

Asphodel [as'fodel]. Plant genus of lily family; in Gk. legend, most famous of all plants associated with underworld.

Asphyxia, first aid for, 3-366.

Aspie. Savoury calf's-foot jelly, with pieces of fowl or meat, herbs, vinegar, and sherry flavoured.

Aspirin. A drug, 3-127; as poison 6 236.

Asquith, H. H. See **Oxford** and **Asquith, Earl of**.

Ass. Member of the horse family 1-275; milk from, 5-205.

Assam. State of India; area 50,000 sq. m.; pop. 9,000,000; cap. Shillong, 1-276; 4-239, 241; earthquakes, 3-152 illus., 153.

ASSAMI

Assam. Language of Assam, 1-276.
Assasins. Mahomedan sect, 1-276.
Assaye, Battle of (1803). Wellington's greatest victory in India, 7-436.
Assaying. Process of finding how much of a given metal is in an ore or alloy.
Assembly, Nouns of, 1-156, 5-468.
Assembly line, in motor-car factory, 5 280, 281 illus.
Assiniboine River. In s. Saskatchewan and Manitoba, Canada; flows 150 m. s.e.; 5-114.
Assignats. Paper money used during Fr. Rev., 3-169.
Assis, Machado de (1839-1908). Brazilian novelists, 7-101.
Assisi (Assisi). Tn. in cent. It.; pop. 20,000; birthplace of St. Francis.
Assut (Assut). Egypt. City near w. bank of Nile; pop. 60,000; once caravan assembly point; site of a Nile barrage, 3-173.
Assize of Bread (1266), 2-50.
Assises. Courts and sessions of judges of the high court when visiting provincial towns for trial of important cases, 2 521.
Association Football. rules and object of game, 3-115.
Associative law, in algebra, 1 108.
Assuan, or Aswan. Anc. Syene, tn. and resort in Upper Egypt on Nile; pop. 22,200; near fine ruins; great Nile dam, 3-38 illus. f.; 3 173; Nile flows, 5-440.
Assur. Original name of Assyria and earliest cap. on Tigris; destroyed by Medes and Chaldeans 606 B.C., 1-337.
Assurbanipal or Ashurbanipal (684-626 B.C.). King of Assyria, called Sardanapalus by Greeks; legend says he burned himself, his wives and treasures to avoid falling into rebel power; library, 4-146; 5 140.
Assyria. Anc. empire of Asia and centre of an early civilization, 1 337; conquest of Israel, 4 374; conquest of Babylon, 1 335, 5-176; conquest of Persia, 6 129; army, 1 245; and Medes, 5 159; statuary, 2 89 illus.; 2-90; painting, 6-33; musical instruments, 5 302; beads, 1 397; costume, 2 14 illus., 2-420. *See also* Babylonia and Assyria.
Astaire, Fred (b. 1899). Amer. film actor and dancer, 3 40 illus.
Astara. Goddess worshipped by Phoenicians; corresponds to Gk. Aphrodite, 6-161; 5-259.
Astatine (At). Chem. element; atomic no. 85; atomic weight 211, 3-224.
Aster. Perennial and annual flowering plants, 1-277.
Asteroides. Starfish class of echinoderms.
Asteroids. Small planets, 6 212, 7 189.
Asthma. Spasm of the bronchial tubes, 5 52; and allergy, 1-112.
Astley, Philip (1742-1814). Eng. showman and riding master; owner of famous circus, 2-401.
Aston, Francis William (1877-1915). Brit. scientist and inventor of mass spectrograph, 4-301.
Aston Villa. Famous Association football club (Birmingham); winners of F.A. Cup six times; in 1896-7 won Cup and League competitions.
Astor of Hever, John Jacob Astor, Baron (b. 1886). Brit. newspaper proprietor; became chief proprietor of *The Times* in 1922.
Astor, Nancy Witcher, Viscountess (b. 1879) in U.S.A. First woman actually to sit in Brit. Parliament (1919).
Astral (as'tragal). A small moulding or bead semicircular in form; called also a roundel; the circular moulding close to the mouth of a gun.
Astrakhan. Town and region of the R.S.F.S.R.; pop. 251,000 (town), 1-277.
Astrakhan sheep. Asiatic breed of sheep; fur used for coats, 7-22, 1-277 with illus., fur, 6-479.
Astrid (1805-35). Queen of Leopold III of Belgium; death, 4-485.
Astrolabe. Early navigational instrument, 5-341.
Astrology. Anc. system of belief in influence of stars and planets on human character and destiny, 1-285; and almanacs, 1-117. *See* Zodiac

Astronomical telescope, 7-248 with illus.
Astronomical Unit. Unit of distance in astronomy. It is defined as the mean distance of the earth from the sun, amounting to 92,900,000 miles. Used as the principal measure of distances within the solar system.
Astronomy. Science dealing with the celestial bodies, 1-278; aurora borealis, 1-310, 5 462; comet, 2-468; constellation, 2 489; earth, 3 149; eclipses, 3-156; equinox and solstice, 3-204; other and space, 3 301; gravitation, 4-65; meteors and meteorites, 5-181; moon, 5-256; nebulae, 5 360; observatory, 5 493; planets, 6-212 (*see also* under names of the planets); relativity, 6 380; spectroscopy, 7 127; spectrum and spectroscopy, 7-127; star, 7 145; sun, 7-188; telescopes, 7 248.
History in China, 2-361; Chaldeans and the zodiac, 1 339; Ptolemy, 6-301; Tycho Brahe, 2 38; Copernicus, 2 301; work of Galileo, 3-499; Kepler's laws, 4 101; Sir James Jeans, 4 358; photography as aid, 6 169; astronomy as a career, 2-232.

SYMBOLS IN ASTRONOMY

☾	new moon	☾
☾	first quarter	☾
☾	full moon	☾
☾ or ☾	last quarter	☾
☼	sun	
☿	Mercury	
♀	Venus	
♁	earth	
♂	Mars	
♃	Jupiter	
♄	Saturn	
♅	Uranus	
♆	Neptune	
♇	Pluto	
☾	conjunction	
☾	opposition	
☾	ascending node	
☾	descending node	

Astrophysics. Science of the physical properties of the stars and other heavenly bodies, 7-127.
Astur'ias. Anc. prov. of n.w. Sp., or corresponding roughly to modern Oviedo, 7 105.
Astysages. The last Median king, reigned 584-530 B.C.; betrayed by his general Harpagus, he was vanquished by Cyrus of Persia, 5-160.
Asuncion. Cap. of Paraguay; pop. 205,605; trade in maté, tobacco, sugar and fruits, 6-76, 77 illus.
Aswan (Egypt). *See* Assuan.
Asynchronous motor. Type of electric motor, 5 276.
As You Like It. Comedy by Shakespeare, 1-285.
Atacama (ah'takah'ma) Desert of large elevated tract in N. Chile barren but rich in minerals; minerals, 2-358; 1-144.
Atahualpa (ah'tah'wah'pa) (c. 1495-1533), last Inca of Peru, captured by Pizarro, 6-211, 6-114.
Ataire, Mt. Highest point on isl. of Rhodes in Aegean Sea, 6 392.
Atalanta. In Gk. myth., a maiden famous for beauty and fleetness, 1-285.
Atatürk. *See* Kemal Atatürk.
At'avism. "Throw-back" to racial or family ancestor.
Athara, riv., rises in N. Abyssinia and flows N.W. 500 m. to Nile, 5-410; battle in 1898 saw victory of British under Kitchener over the Mahdi.
Athens-Alakakh. Ancient Hittite cap. of Hattay, Turkey excavated 1947.
At'ebria. Synthetic substitute for quinine; also called mepacrine, 6-325.

ATLANTIC CITY

A tempo. *See* Musical Terms (table).
Athabascans. People of Alaska, 1-90.
Athabaska. Lake in N. Alberta and Saskatchewan, Canada; 2,812 sq. m.; 6-500, 5 64.
Athabaska River, in Alberta, Canada, flows 776 m. S.E. to Athabaska L.; becomes Mackenzie r., 5 64; oil-soaked sands, 1 93; 6-152.
Athallah (ath'al'la). Daughter of Ahab and wife of Jehoram; slaughtered grandsons except one, and seized power; was put to death six years later on coronation of Joash, the heir who had been kept in hiding (2 Kings xi.); subject of Racine's tragedy *Athalia*.
Athanas'ius, Saint (297-373). Bishop of Alexandria, chief defender of orthodox doctrine of Trinity against Arianism, 1-101.
Athelney, Somerset, Eng.; Alfred's jewel found, 1-101.
Athelstan or Æthelstan (c. 895 910). Saxon king, succeeded 924; grandson of Alfred the Great; first Saxon king to be called king of all Brit., defeated Celts and Danes at Brunanburgh in 937; conquered Sicily Is., 6-509.
Athens (goddess). *See* Athene.
Athenaeum, The (ath'ni-um). Club in Pall Mall, London, founded in 1821. Members are men of considerable eminence in the literary, scientific, or artistic world, 2 424, with illus.
Athene. In Gk. myth., goddess of wisdom; identified with Rom. Minerva, 1-286; Parthenon as shrine of, 1 12, 13; and Perseus, 6 128; statue by Phidias, 6-153; challenge by Arachne, 7-133; and Trojan War, 7-320.
Athens, S.S. Brit. trans Atlantic liner of Donaldson line, first U boat victim of Second World War; sunk Sept. 3, 1939, 250 m. N.W. of Ireland with loss of 128 persons, 1 293.
Athens. Cap. of Greece; pop. 181,000; with Piræus and suburbs, 1,368,000, 1 287; in Gk. history, 4 70, 77, 7 124; and Athene, 1 286; rule of Pericles, 6-125; civil service, 2 105; Acropolis, 1 12; agora, 4 75 illus.; Plato's academy, 1 9; sculpture by Phidias, 6 153; Lycabettus monument to Dionysus, 4 81 illus.; development of the drama, 3 115; theatre of Dionysus, 7-263; legend of Theseus, 7 268. *See also* Acropolis; Greece; Greek Art; Parthenon.
Atherton, Gertrude (1857 1948). American writer, stories of old-time California, 7 365.
Athlete's foot, a fungus disease, 3 189.
Athletics, 1 280; Olympic Games, 5 508; physical education, 6-183. See also Athletic Records in pages 228 and 229.
Athlone. Market tn. in co. Westmeath, Irish Rep., on r. Shannon, 7-17 illus.
Athlons, Alexander Augustus Cambridge, Earl of (b. 1871). 3rd son of Duke of Teck and brother of Queen Mary. Married Princess Alice of Albany in 1904. Gov.-gen. of Union of S. Africa (1923-31); gov.-gen. of Canada (1940-46).
At'hodyd. *See* Aeronautics (table).
Athor or Hathor. Egyptian goddess, sometimes identified with Isis and Gk. Aphrodite; usually represented with cow's head or horns.
Athos. Peninsula N.E. Greece; Mt. Athos (6,350 ft.).
Atlanta. Cap. of Georgia, U.S.A., pop. 331,314; mfrs. cotton goods, engines, machinery, 3-524; in Amer. civil war, 4-518.
Atlantic, Battle of the (1939-45), in 2nd World War, 1-293.
Atlantic Charter. Eight-point declaration issued by Roosevelt and Churchill, and announced by Attlee, Aug. 14, 1941, formulating Brit. and U.S. war and peace aims; signed by 26 nations, Jan. 1, 1942; 6-450, 7-324.
Atlantic City. City and seaside resort of New Jersey, U.S.A., 56 m. S.E. of Philadelphia; pop. 61,657.

RECORDS IN AMATEUR ATHLETICS

Abbreviations: h., hour(s); m., minute(s); s., second(s).

Note: Records are given as in August, 1956.

FLAT RACING

<i>World record</i>		<i>British (all-comers) record</i>	
100 yards ..	9.3 s.	9.6 s.	J. Conwell (U.S.A.), 1947. E. McDonald Bailey (Trinidad), 1947-52 (6 times). L. Romigino (U.S.A.), 1951.
220 yds. ..	20.0 s.	20.9 s.	H. H. McKenley (Jamaica), 1952.
440 yds. ..	45.8 s.	46.8 s.	V. G. Rhoden (Jamaica), 1952.
880 yds. ..	1 m. 47.5 s.	1 m. 48.6 s.	B. S. Hewson (G.B.), 1955.
1 mile ..	3 m. 58.0 s.	3 m. 59.0 s.	J. Tabori (Hungary), 1955.
2 miles ..	8 m. 33.4 s.	8 m. 33.4 s.	S. Iharos (Hungary), 1955.
3 miles ..	13 m. 14.2 s.	13 m. 23.2 s.	C. J. Chataway (G.B.), 1955.
6 miles ..	27 m. 43.8 s.	28 m. 19.4 s.	D. A. G. Pirie (G.B.), 1953.
10 miles ..	48 m. 12.0 s.	49 m. 53.2 s.	F. Norris (G.B.), 1956.
1 hour ..	12 miles 810 yds.	12 miles 60 yds.	F. Norris (G.B.), 1956.
15 miles ..	1 h. 14 m. 01.0 s.	1 h. 19 m. 19.4 s.	J. W. Stone (G.B.), 1954.
	M. E. Patton (U.S.A.), 1948. H. D. Hogan (Australia), 1954. J. J. Golliday (U.S.A.), 1955. L. King (U.S.A.), 1956. D. Sime (U.S.A.), 1956. D. Sime (U.S.A.), 1956. J. Lea (U.S.A.), 1956. L. V. Spurrier (U.S.A.), 1955. J. M. Landy (Australia), 1954. S. Iharos (Hungary), 1955. S. Iharos (Hungary), 1955. S. Iharos (Hungary), 1956. E. Zatopek (Czechoslovakia), 1951. E. Zatopek (Czechoslovakia), 1951. E. Zatopek (Czechoslovakia), 1955.		

HURDLE RACING

120 yds. ..	13.5 s.	13.9 s.	W. F. Porter (U.S.A.), 1948. H. Dillard (U.S.A.), 1952.
220 yds. ..	22.2 s.	23.3 s.	P. B. Hildreth (G.B.), 1955.
440 yds. ..	51.3 s.	51.3 s.	V. N. Lituyev (U.S.S.R.), 1954.
	R. H. Attlesley (U.S.A.), 1950. J. Davis (U.S.A.), 1956. D. Sime (U.S.A.), 1956. Y. N. Lituyev (U.S.S.R.), 1954.		

RELAY RACING

4 x 110 yds. ..	40.1 s.	40.7 s.	U.S.A. team, 1952.
4 x 220 yds. ..	1 m. 24.0 s.		
4 x 440 yds. ..	3 m. 08.8 s.	3 m. 08.8 s.	U.S.A. team, 1952.
4 x 880 yds. ..	7 m. 25.2 s.	7 m. 29.2 s.	U.S.A. team, 1952.
4 x 1 mile ..	16 m. 41.0 s.	16 m. 41.0 s.	G.B. & N. Ireland team, 1953.
	University of Texas (U.S.A.), 1956. University of S. California (U.S.A.), 1949. Abilene Christian College (U.S.A.), 1956. U.S.A. team, 1952. South Pacific A.A.U. (U.S.A.), 1956. G.B. & N. Ireland team, 1953.		

TRACK EVENTS OVER METRIC DISTANCES (WORLD RECORDS)

FLAT RACING

100 metres ..	10.2 s.	1,500 metres ..	3 m. 40.8 s.
	J. G. Owens (U.S.A.), 1930. H. Davis (U.S.A.), 1941. L. B. La Beach (Panama), 1948. H. N. Ewell (U.S.A.), 1948. E. McDonald Bailey (G.B. & N. Ireland), 1951. H. Futterer (Germany), 1954. B. Morrow (U.S.A.), 1956. T. Murchison (U.S.A.), 1956. T. Baker (U.S.A.), 1956.		S. Iharos (Hungary), 1955. L. Tabori (Hungary), 1955. G. Nielsen (Denmark), 1955.
200 metres ..	20.0 s.	2,000 metres ..	5 m. 02.2 s.
	D. Sime (U.S.A.), 1956.		I. Rozsavolgyi (Hungary), 1955.
400 metres ..	45.2 s.	3,000 metres ..	7 m. 52.8 s.
	L. Jones (U.S.A.), 1956.		G. Pirie (G.B.), 1956.
800 metres ..	1 m. 45.7 s.	5,000 metres ..	13 m. 36.8 s.
	R. Moons (Belgium), 1955.		G. Pirie (G.B.), 1956.
1,000 metres ..	2 m. 19.0 s.	10,000 metres ..	28 m. 12.8 s.
	A. Boysen (Norway), 1955. I. Rozsavolgyi (Hungary), 1955.		S. Iharos (Hungary), 1956.
		20,000 metres ..	59 m. 51.8 s.
			E. Zatopek (Czechoslovakia), 1951.
		25,000 metres ..	1 h. 16 m. 36.4 s.
			E. Zatopek (Czechoslovakia), 1955.
		30,000 metres ..	1 h. 35 m. 23.8 s.
			E. Zatopek (Czechoslovakia), 1952.

HURDLE RACING

110 metres ..	13.4 s.	J. Davis (U.S.A.), 1956.
200 metres ..	22.2 s.	D. Sime (U.S.A.), 1956.
400 metres ..	49.5 s.	G. Davis (U.S.A.), 1956.

RELAY RACING

4 x 100 metres ..	39.8 s.	U.S.A. Olympic Team, 1936.
4 x 200 metres ..	1 m. 24.0 s.	University of S. California (U.S.A.), 1949. Abilene Christian College (U.S.A.), 1956.
4 x 400 metres ..	3 m. 03.9 s.	Jamaican Olympic Team, 1952.
4 x 800 metres ..	7 m. 25.2 s.	South Pacific A.A.U. (U.S.A.), 1956.
4 x 1,500 metres ..	15 m. 14.8 s.	Budapest Honved Sport Egyesulet (Hungary), 1955.

FIELD EVENTS

<i>World record</i>		<i>British (all-comers) record</i>	
High Jump ..	7 ft. 0½ ins.	6 ft. 8½ ins.	W. F. Davis (U.S.A.), 1952.
Long Jump ..	20 ft. 8½ ins.	25 ft. 8 ins.	W. S. Steele (U.S.A.), 1948.
Pole Vault ..	15 ft. 7½ ins.	14 ft. 8 ins.	R. E. Richards (U.S.A.), 1951.
Hop, Step and Jump ..	53 ft. 3 ins.	51 ft. 3½ ins.	J. P. Metcalfe (Australia), 1934.
	C. Dumas (U.S.A.), 1956. J. C. Owens (U.S.A.), 1935. G. A. Warmerdam (U.S.A.), 1942. L. M. Sheherbakov (U.S.S.R.), 1953.		

ATLANTIC FLIGHTS

Atlantic flights, by Alcock and Whitten Brown, 1-33 illus.; by Lindbergh, 4-513; first double air crossing (R. 34), 1-84.

Atlantic Ocean, 1-292; 5-494; battle of, 1-293; iceberg patrol, 4-229; first trans-Atlantic radio message, 6 313; submarine cables, 2-153, 7-210; first double air crossing, 1-84; Lindbergh's solo flight, 4-513.

Atlantic Star, Brit. Empire medal for service in Battle of Atlantic, 2nd World War, amounting to six months afloat in R.N. or M.N. in Atlantic or home waters.

Atlantis, Fabled Island, 1 295.

Atlas, In Gk. myth., rebellious Titan, brother of Prometheus; condemned to bear the world on his shoulders; father of the Hesperides; Hercules and, 4-166; and Perses, 6-128.

Atlas, Series of maps, 5-119.

Atlas Mtn., 2-112 illus.

Atlas Moth, Range in N.W. Africa, 1-109 with map; in Morocco, 5 261.

Atmosphere, Gaseous envelope surrounding the earth, 5-180; of planets and Earth, 1-82; of prehistoric Earth, 3-150; on moon, 5 257; explored by rocket, 6 122 illus.; oxygen in, 6 22; helium in, 4 160; hydrogen in, 4-221; barometers, and, 1-370; pressure in siphon, 7-58; humidity measured by hygrometer, 4-225; and mountaineering, 3 321; *see also* Air; Meteorology.

Atmospherics, Electrical discharges which take place in the atmosphere. They are electromagnetic waves set up by electrical discharges such as sunspots, lightning, and similar electrical disturbances, and, cascade crackles in loudspeakers, interfere with the proper reception of radio signals.

Atoll, Coral islets found in Pacific Ocean, 6 28, 2 501, 6 188 illus.

Atom, Minute fundamental particle, out of which all matter is built up, 1 296; arrangement in crystals, 3 4; carbon, 2 219 with diag.; behaviour in chemical reaction, 1 11; chemical theory of, 2-317; combustion and explosives, 3-329; electrons, 3 221; hydrogen atoms, 4 221; isotopes, 4 301; lattice-distortion in alloys, 1-111 with diag.; nuclear fission, 6 351, 1-300; quantum theory, 6 317; radio-activity, 6 351.

Atom bomb, 1 301, 303; at Hiroshima, Japan, 4 350, 7 198; at Nagasaki, 7-198; and uranium, 7 370.

Atomic energy, 1 299; cyclotron, 3 17.

Atomic Energy Commission, set up by U.N. to discuss the international control of atomic energy; suspended activities 1948 for lack of agreement between Russia and other members.

Atomic numbers, as fundamental properties of atoms, 5-169.

Atomic pile. *See* Nuclear reactor.

Atomic series, in nuclear fission, 6-351.

Atomic weight, of elements, 1-296; as average of isotopes, 4-301, 5-169.

Atonement, Day of, Fast day of the Jews; Yom Kippur, observed on 10th day of 7th month of sacred year.

Atoxyl, a remedy for sleeping sickness.

Atreus (átrús). In Gk. myth., father of the Atreidae, Agamemnon and Menelaus; slew children of his brother Thyestes and served them to him as food, thus drawing down curse on his race; reconstruction of treasury, 4 73 illus.

Atrophy, Wasting away of the body or its organs through disease or want of nourishment.

Atropine, Poison obtained from deadly nightshade; used by oculists, 5 139, 6-236.

Atropos, In Gk. myth., the eldest Fate, who cuts the thread of life, 3 343; deadly nightshade named after, 5 139.

Attack Angle. *See* Aeronautics (table).

Attar of roses, An essential oil from rose petals, produced in Bulgaria, 2 119, 5-506, 6-124.

Atterbury, Francis (1602 1732), Eng. scholar, politician and divine; became Bishop of Rochester in 1713; committed to Tower of London for plotting against George I and later banished from Eng.

Attica, Dist. of anc. Greece on Aegean Sea; Athens the ruling city; mts. include Hymettus, Parnassus and Helicon.

Attic dialect in Gk., 4 92.

Attila (c. 400 453), King of the Huns; called "the scourge of God," 1 306, 4 208.

Attlee, Clement Richard (b. 1883), Brit. statesman and Labour party leader, 1 306, 4 127.

Attock, Fort in Punjab, Pakistan, on r. Indus.

Attorney-General, Principal law officer of govt. of certain countries.

Attu, Isl. of the Aleutians, 1 90.

Atwell, Mabel Lucie (b. 1879), Brit. artist; creator of a popular type of chubby child.

Aube, Riv. of N.E. Fr., tributary of Seine, about 150 m. long, 6 530.

Auber, Daniel (1782 1871), Fr. musical composer, regarded as founder of Fr. grand opera (*Fra Diavolo*), 5 511.

Auber, Harriet (1773-1862), Hymn writer; origin of "Our Blest Redeemer, ere He breath'd," 4 226.

Aubergine or Egg Plant, Annual plant bearing egg-shaped fruit; native to tropics. Fruit is eaten curried, fried, or cooked in a casserole.

Aubrey, John (1626-97), Eng. antiquary, student of Avebury, Stone-

henge, etc.; his *Miscellanies* contain a host of anecdotes and curiosities; and Avebury, 1-328.

Aubusson (óbúsawn), Tn. of cent. France, dept. of Creuse; famous for mfr. of carpets for 400 yrs.

Auchinlock, Field-Marshal Sir Claude (b. 1881), G.O.C. Middle East, 1941-42; held off Rommel's forces in difficult period; c.-in-c. India, 1943 47.

Auchterarder, Tn. in Perthshire, Scot., pop. 2,131, 6 138.

Auckland, Spt. and city in N. Island, New Zealand; pop. 127,423; (with associated boroughs, 1951 est., 361,600), 1 306, 5-122.

Auckland Islands, uninhabited group, 200 m. S. of New Zealand.

Auction, A public sale in which items are sold to the highest bidder.

Auctioneering and Estate Management, as a career, 2 232.

Aucuba japonica, Lat. name for variegated or Japanese laurel, 4 455.

Aude, riv. of Fr., rises in Pyrenees, flows 130 m. N. and E. to Golfe du Lion nr. Narbonne, 6 314.

Auden, Wystan Hugh (b. 1907), Anglo-Amer. poet (naturalised Amer. 1946); first pub. *Poems* (1930); collaborated in verse dramas with Christopher Isherwood, 3 122; 3 291.

Audio-frequency, the low frequencies perceptible by the human ear.

Audiometer, Instrument by which the power of hearing, or the audibility or intensity of sounds, can be measured.

Auditor, One appointed to audit, i.e. examine, accounts.

Audubon, John James (1785 1851), Amer. naturalist, 1 307.

Audubon Society, work of, 1 308.

Aue, Hartmann von. *See* Hartmann von Aue.

Augean stables, In Gk. myth., cleansed by Hercules; story, 4 166.

Aughrim (aw'grim), Battle of. Fought at Aughrim, Galway, Ire., between Eng. and combined forces of Ir. and Fr., July 12, 1691, ended in victory for the Eng., 2 32.

Aughtie, crystal, 3 4 illus.

Augsburg (ow'g's-bórksh), Ger. mfg. city on r. Leck; pop. 185,700; textiles; founded 14 n.c.; 1 387.

Augsburg Confession, statement of Lutheran faith, 5 53; 6 377.

Augsburg, Peace of (1555), 6 377.

Augurs, In anc. Rome, members of a religious college whose duty it was to interpret the signs (*auspices*) of approval or disapproval sent by the gods in reference to any proposed undertaking; these signs were found in the sky (as thunder and lightning), in flight and feeding of birds, condition of entrails of animals sacrificed, etc.

RECORDS IN AMATEUR ATHLETICS—(continued)

FIELD EVENTS—(continued)

World record		British (all-comers) record	
Putting the Weight ..	61 ft. 4 ins.	W. P. O'Brien (U.S.A.), 1956.	57 ft. 10 ins.
Throwing the Hammer	217 ft. 9½ ins.	M. P. Krivososov (U.S.S.R.) 1956.	196 ft. 0½ ins.
Throwing the Javelin	274 ft. 5½ ins.	Janusz Sidlo (Poland), 1956	210 ft. 11¼ ins.
Throwing the Discus	194 ft. 6 ins.	F. E. Gordlen (U.S.A.), 1953.	186 ft. 0 ins.
			K. Merta (Czechoslovakia), 1955

WALKING

World record		British (all-comers) record	
2 miles ..	12 m. 45.0 s.	V. Hardmo (Sweden), 1945.	13 m. 11.4 s.
5 miles ..	31 m. 32.8 s.	J. Dolezal (Czechoslovakia), 1955.	34 m. 32.8 s.
7 miles ..	48 m. 15.2 s.	V. Hardmo (Sweden), 1945.	49 m. 28.6 s.
10 miles ..	1 h. 10 m. 45.8 s.	J. Dolezal (Czechoslovakia), 1954.	1 h. 14 m. 30.6 s.
20 miles ..	2 h. 33 m. 09.4 s.	J. Dolezal (Czechoslovakia), 1954.	2 h. 40 m. 10.0 s.
30 miles ..	4 h. 12 m. 03.4 s.	Ladislav Moc (Czechoslovakia), 1956.	4 h. 29 m. 31.8 s.
1 hour ..	8 miles 1.025 yds.	J. F. Mikaelsson (Sweden), 1945.	8 miles 474 yds.
2 hours ..	16 miles 126 yds.	A. Vedjakov (U.S.S.R.), 1955.	15 miles 701 yds.
			R. Bridge (G.B.), 1914.

AUGUST

August, the 8th month, originally called *Sextilis* and renamed in honour of the Roman Emperor Augustus, 5-255.
Augusta, Cap. of Maine, U.S.A.; pop. 20,913, 5-90.
Augustan Age. Period of literary excellence during reign of Rom. emperor Augustus, 1-309.
Augustine, St. (d. 604). Missionary sent by Pope Gregory I to convert England. First archbp. of Canterbury, 1-308; 2-276; and Gregory the Gt., 4-95.
Augustine of Hippo, St. (354-430). Founder of Augustinian order of monks, 1-308.
Augustinians. Order of monks and friars, 1-308, 5-245.
Augustus (63 B.C. A.D. 14). Emperor of Rome, 1-308, 6-134; and Cleopatra, 2-408; and Mark Antony, 5-129; statue, 6-412 illus.; bust, 6-444 illus.; coin, 6-235 illus.
Auk. Family of birds, 1-309.
Auld Brig, of Ayr, 1-330 with illus.
Auld Kirk. Name given to the established Church in Scot., 4-414.
Auld Lang Syne (Scot., "times gone by"). A Scot. popular song; words written by Robert Burns; probably set to music by George Thomson (1799).
Auld Reekie. Nickname for Edinburgh. See *Edinburgh*.
Aulos. Auc. (ik. wind-instrument, 5-302.
Aulus Plautius, Roman general; conquers Britain, 2-73.
Aurelia. Jelly-fish; life history of, 4-361 illus. f.
Aureomycin, an antibiotic; used in treatment of pneumonia, 1-175.
Auricles. Upper chambers of the heart, 4-114 with diag.
Aureiula. Perennial plant, native to Swiss Alps. Flowers borne cowl-like fashion in cluster at top of leafless stem. Many varieties in gardens.
Auriga or the *Charioteer*: Constellation (contains Capella star of first magnitude), 2-490 diag.
Aurignac (Jörényak). A town in N. France where valuable palaeolithic remains were found; type of man to which they belonged is known as *Aurignacian*.
Auriol (Jérôme), Vincent (b. 1884). Fr. statesman; pres. constituent assembly, 1946; first pres. fourth republic, 1954-54.
Aurochs. See *Bison*.
Aurora. Goddess of the dawn, 1-310.
Aurora Australis, streamers of light seen in the southern sky, 1-311.
Aurora Borealis or "northern lights," 1-310 illus. f.; seen in Norway, 5-482
Aurangzeb (Jawrangzeb) or Aurangzeb (1618-1707). Last powerful Mogul emperor of India, 5-239.
Auschwitz (Pol. Oswiecim). Polish tn. 33 m. W. of Cracow; site of tier. concentration camp in 2nd World War, notorious for its appalling atrocities; Rudolf Hoess, commander, executed April 1947.
Aussig (Czech). See *Ústí nad Labem*.
Austen, Jane (1775-1817). Eng. novelist, 1-311, 5-472, 3-290.
Austerlitz, battle of (1805), in Napoleonic Wars, 5-320.
Austin, Alfred (1835-1913). Eng. poet laureate, 6-332; edited *The National Review* (1883-93); most of his work was mediocre.
Austin, Herbert. 1st Baron (1866-1941). Eng. motor vehicle manufacturer, 1-314; mass production methods, 5-283.
Austin, Herbert Wilfred (b. 1906). Eng. lawn tennis player; finalist at Wimbledon in 1932 and 1938, and played in Britain's Davis Cup team.
Austin. Cap. of Texas, U.S.A.; pop. 132,459, 7-260.
Austin 7 or *Baby Austin*. First generally successful small car; appeared in 1922, 1-311 with illus.
Australasia. All the isls. of the S. Pacific, including Australia, New Zealand, Tasmania, New Guinea, Polynesia and Melanesia.

Australia. Isl. continent in S. hemisphere, a member-nation of the Brit. Commonwealth; area (incl. Tasmania) 2,974,581 sq. m.; pop. 7,911,800; Federal cap. Canberra, 1-312; major f. 1-317, 318; population, 1-321; aborigines, 2-12, 5-77, 81; boomerang, 2-12; Great Barrier Reef, 2-504; national emblem, 1-8 illus.; bottle-tree, 2-26; eucalyptus, 3-305; marsupials, 5-137; lyre-bird, 5-55; rabbits as pest, 6-327; history, 1-317; Cook's voyages, 2-494; colonization and development, 2-83; gold discoveries, 4-39; industry, 1-320; copper production, 2-503; agriculture, 1-319; bees imported, 4-270; sheep stations, 7-23; Canberra and Capital Territory, 2-200; Antarctic territories, 1-170; trustee territories in Pacific, 6-32; in New Guinea, 5-398; police force, 6-253; transport, 1-320; diesel locomotive, 5-5 illus.; flag, 3-384 illus. f.; lacrosse, 4-435; test matches against Eng., 2-531; literature, 1-321.
Australia House. London h.q. of the Australian Commonwealth at corner of Strand and Aldwych.
Australian Alps. Range in S.E. Australia nearly parallel with coast; includes Mt. Kosciuszko (7,320 ft.), highest point on continent.
Australian Capital Territory. Seat of Australian parliament, pop. 16,908, 1-319.
Australian Football, 3-417.
Australian Terrier. See *Dogs (table)*.
Australiforme. Division of the races of mankind; characteristics, 6-333, 335 illus.
Austral Islands. See *Tubuai*.
Austria. Part of the Austro-Hungarian Empire up to 1st World War, and afterwards an independent republic; area 32,375 sq. m.; pop. 6,919,000; cap. Vienna, 1-322, 4-207, 7-397-99 with illus.; in European hist., 3-314, 7-388, 7-399, 486; Anachluis, 1938, 4-10; flag, 3-384 illus. f.; Tirol in, 7-280; murder of Dollfus, 7-399. See also *Austria-Hungary*.
Austria-Hungary. Empire of the Hapsburgs, dissolved in 1918; included Austria, Hungary, Czechoslovakia, parts of Yugoslavia, Rumania, and Poland, 1-325, 4-207, 3-316; Bosnia and Herzegovina, 2-20; Hapsburg rulers, 4-129; relations with Serbia, 6-332, 7-478; and It. unification, 4-316; Seven Years' War, 7-2; and 1st World War, 7-478, 483, 484.
Austrian Netherlands. Name given to Spain, Netherlands after their cession to Austria (1713); consisted chiefly of provinces now composing Belgium.
Austrian Succession. War of (1740-48), 1-326; Maria Theresa, 5-125; and Seven Years' War, 7-2; treaty of Aix-la-Chapelle, 1-1.
Austronesian languages, 6-158.
Authorized Version (A.V.) of the Bible. Translation, authorized by James I of England, 1-413 with illus.
Authorship, as a career, 2-232.
Autobahnen. Fast motor roads in Germany, 4-5; 6-108.
Autobiography, 1-447.
Autocracy (awtokrasi). A form of government in which a single person has absolute power (from Greek words for "self" and "power").
Auto-da-fé (Portuguese, act of faith), and Inquisition, 4-203.
"Autogiro". Ve. ticen-lift aircraft with free rotor, 1-326; and helicopter development, 4-158.
Automatic casting machine, of "Monotype" typesetting machine, 5-247 with illus.
Automatic control, 1-327; electronic devices, 3-222; on lifts, 4-493, 496; see also *Photo-electric devices*.
Automatic parachute, on meteorological balloons, 6-75.
Automatic pilot. Instrument which by means of a gyroscope keeps an aeroplane on a pre-set course, 4-114.
Automatic rifle, 3-360.
Automatic sprinklers. See *Water sprinklers*.

AVOGADRO

Automatic telephone. See *Telephone*.
Automation. The automatic control of machinery, chiefly by electronic devices, which reduces repetitive manual work to a minimum. Such devices can be applied to office work as well as to direct production.
Automobile Association (A.A.). Founded in 1905. H.q. Farnham House, New Coventry St., London, W.1. Gives legal aid to members summoned for motoring offences; has comprehensive system of road signs, and extensive road patrols.
Autonomy (awtonomi). self govt. Used not only in absolute sense, but especially of countries which, while subject in some matters to another power, are in other respects self-governing.
Autoplasty. Surgical operation to mend or replace an injured or diseased part from a sound part of a patient's body.
Autostrade (owtostrahda). Name of high-speed motor-roads in It. and Fr., 6-108.
Auto-suggestion. The hypnotic power of the mind to influence the self, in mind or body; exploited by F. Coué.
Autumn. Third season in the year; the Amer. "fall"; leaves in, 4-472.
Autumnal equinox, 3-294.
Autumn crocus, true and false, 2-533.
Autumn Gentian, plant, 2-24 illus. f.
Auvergne. Former prov. of cent. Fr. (now depts. of Cantal, Puy de Dôme, and part of Haute-Loire), 3-434.
Auvergne Mts.. Branch of Cévennes in S. cent. France; picturesque scenery; Pic de Sancy, 6,188 ft.
Auxiliary Territorial Service (A.T.S.). See *Women's Royal Army Corps (W.R.A.C.)*.
Auxins (awk'zinz). Substances produced by plants which control rate of growth; synthetic auxins (e.g. colchicine) used to produce abnormally large plants, flowers, or fruits.
Ava. See *Kava*.
Avallanohe, 1-328.
Avalon. In Celtic myth., legendary island in Atlantic; comparable with Norse Valhalla; where King Arthur was taken to be cured of his wounds, 1-295.
Avars. A people of Ural-Altaic stock allied to the Huns; settled Dacia about 555.
Avatcha. See *Kamchatka*.
Avebury, John Lubbock, 1st Baron (1834-1913). Eng. archaeologist, anthropologist, and entomologist, 1-329; colour experiments with bees, 1-409; founded Bank Holidays.
Avebury. Wilt., Eng.; site of prehistoric stone circles, 1-328.
Avellaneda. Dept. of Argentina; pop. 279,392, 1-223.
Aventine Hill. Southernmost of the seven hills of Rome.
Aventurine. Variety of natural silica, used as ornamental stone; reddish or greyish brown.
Aver'nus. Small L. near Naples, It., in crater of extinct volcano; ancients thought it entrance to infernal regions.
Averroes (aver'6ez) (1126-98). Arabian philosopher; commentaries on Aristotle.
Avery, Captain (17th cent.). Eng. pirate, 6-206.
Aves (zool. class). See *Birds*.
Aviary. Large cage for keeping birds.
Aviation. See *Aeroplane*; *Airship*; *Balloon*.
Avicenna (avisen'a) (980-1037). Arabian philosopher and physician; European medicine in Middle Ages guided by his works, based on Galen, Hippocrates, and Aristotle.
Avignon. City of Fr., cap. of Vaucluse dept.; pop. 80,000, 1-329; on Rhône, 6-366.
Avila. Medieval walled city of Spain 7-108 illus.
Avocado Pear. See *Alligator Pear*.
Avocet. Bird of the plover family. 7-108; nesting habits, 6-227.
Avogadro (avogah dro). Amadeo (1776-1856). It. physicist; formulator of Avogadro's law, 3-508.

AVOGADRO'S LAW

Avogadro's law. That under the same temperature and pressure equal volumes of all gases contain the same number of molecules.

Avon, Lower. Riv. flowing 75 m. through Gloucestershire, Wilts and Somerset to Bristol Channel at Avonmouth; at Bristol, 2-72, 7-84.

Avon, riv. of Warwickshire, Eng., rising nr. Naseby in Northants, flows through Leicestershire, Warwickshire and Gloucestershire to the Severn riv. at Tewkesbury; 96 m. long, 4-476.

Avonmouth. Port and docks at mouth of the Lower Avon, 6 n. n.w. of Bristol, 2-73.

Avro jet fighter, delta wing design, 4-369 illus.

Awaj (river). See Abana.

Awe, Loch. Longest L. in Scot., in Argyllshire (22 m.); has many isls., on one of which is the ruined castle of Kilchurn, 6-510.

Axe Edge. Highest point in Staffs, Eng., 1,807 ft., 7-141.

Axholme, Isle of. Low-lying region of N.W. Linco., separated from rest of co. by riva. Trent, Idle, Torne, and Don. Once a forest, later a marsh which was drained (1625-31) by order of Charles I. Area 75 sq. m.

Axioms, in geometry, 3-519.

Axis. Term for Italo-Ger. collaboration 1936-43, 7-485. In 1940 it became the Berlin-Rome-Tokyo Axis, when Japan joined, 3-317. See Anti-Comintern Pact; Berlin Pact.

Axis deer. Animal native to India and Ceylon, 3-60.

Axminster. Market tn. of Devonshire, on r. Axe; pop. 2,673; ancient church; celebrated for rugs formerly made there.

Axminster carpets, 2-249, 250, 253 illus f.

Axolotl. A kind of salamander found in Mexico.

Ayala Ramon Pérez de (b. 1880). Spanish poet, critic, and novelist; called greatest of modern Spanish poets, 7-122 with illus.; ambassador to Gr. Brit. in 1931.

Aye-Aye. A type of lemur found in Madagascar, so named from its cry, 4-478.

Ayesha (c. 611-c. 678). Wife of Mahomet.

Aygues. Tributary of riv. Rhône, rising in Alps, about 160 m. long, 6-396.

Aylesbury. Co. tn. of Bucks, Eng.; pop. 21,051; noted for ducks and dairy produce; book-binding, engineering, felt processing, butter-blending, 2-105.

Aylesham. Tn. in Norfolk, Eng. pop. 2,610 5-448.

Aymara Indians. S. Amer. tribe, living around L. Titicaca; high culture before conquest by Incas.

Ayr, Scot. Spt. on Firth of Clyde; co. tn. of Ayrshire; pop. 43,011; woollens, carpets, engineering, ship-building, 1-330.

Ayrshire. Co. of Scot.; area 1,130 sq. m.; pop. 321,184; co. tn. Ayr, 1-330; battle of Largs, 7-270.

Ayrshire, breed of dairy cattle, 2-271, 275 illus.

Aytoun, William Edmondstone (1813-

65). Scot. poet; wrote "Lays of the Scottish Cavaliers"; 6-511.

Ayudhya. Former cap. of Siam, 7-45.

Azalea. Shrub, family *Ericaceae*, grouped with rhododendron, 1-330.

Azala, Manuel (1880-1940). Span. statesman; pres. of Spanish Rep. 1931-33 and 1936-39.

Azerbaijan. Republic of the U.S.S.R.; area 33,460 sq. m.; pop. 3,210,000; cap. Baku, 6-477.

Azerbaijan. Prov. of s.w. Persia on Caspian Sea; 33,610 sq. m.; pop. 2,096,000; iron, lead, copper, marble; cap. Tabriz.

Azhar, El. Muslim university and mosque in Cairo, 2-164, 165 illus.

Azilians. Prehistoric people living some 12,000 years ago in Europe; hunters, 5-105 illus f.

Azinocourt. See Agincourt.

Azores. Group of Portuguese isls. in Atlantic, about midway between Europe and Amer.; area 922 sq. m.; pop. 287,000, 1-330, 6-267; bases leased to Brit., 1-294, 6-270.

Azorin. See Martinez Ruiz, José.

Azov. Russ. tn. on s. arm of Don, 20 m. from mouth; pop. 17,000, captured by Peter the Great, 1-331.

Azov, Sea of. Gulf of the Black Sea; area 14,520 sq. m., 1-331; and legend of the Amazons, 1-130.

Azrael (az'ra'el) (Hebrew, "help of God"). Mahomedan angel of death.

Aztecs. Anc. people of Mexico, 1-331, 5-188; foundation of Mexico City, 5-189; sun goddess, 6-490; marriage custom, 5-131; conquest by Cortés, 2-513, 1-134.

B

OUR letter B seems to have started its career in the shape of a crane (bird), in Egyptian picture-writing. Presently the Egyptian scribes gave it a simpler form, which resembled the outline of a tent. So when the Phoenicians and Hebrews took the symbol into their alphabets, they named it *Beth*, which means "house." The Phoenician form of the letter resembled a tent supported by its pole, but some of these early B's or

Beths, it seems, were more aristocratic than the tent Beths, for Dr. Isaac Taylor in his story of the alphabet says: "Other forms suggest . . . a two chambered eastern house (notice that our big B has two rooms) with the men's apartment on one side and the women's on the other." In sound B is closely related to *p*, *f*, *v* and *m*. Martial, the Roman wit, said of the Spaniards, who pronounce *b* as *v* and *v* as *b*, that *vivere* (to live) was *bivere* (to drink).

Baal (bā'al). Semitic name for a lord, master, or god; especially sun-god of Canaanites and Phoenicians, 6-161.

Baalbek. Anc. Syrian city famous for Rom. ruins, 4-473; called Heliopolis by Greeks.

Baba, Cape, westernmost point of Asia, 1-265.

Babakoto (lemur). See Indri.

Babal (Persia). See Barfush.

Babar the Tiger (c. 1483-1530). Mahomedan conqueror and founder of Mogul dynasty, 5-238; conquest of N. India, 4-251; and Agra, 1-69; tomb, 1-47 illus.

Babbage, Charles (1792-1871). Eng. mathematician; invented calculating machine, 2-167 with illus.

Babel, Tower of. 1-335; identified with E-temenanki tower, 1-336.

Bab-el-Mandeb, Strait of. Channel separating Arabia from Africa. Arab name means gate of tears. In reference to hazards encountered by navigators.

Babington, Anthony (1561-86). Page to Mary Queen of Scots; executed for conspiracy to murder Elizabeth I.

Babirusa (babirō'sa). A species of wild hog, native of the East Indies, 7-121 illus. f.

Baboon. Type of monkey, 5-241.

Babrius (1st cent. A.D.). Collector of Aesop's fables, 1-46.

Babylon. Cap. of anc. Babylonia on Euphrates, 70 m. s. of Baghdad, 1-335; 5-176; and tower of Babel, 1-335; earliest bridge, 2-41; taken by Alexander, 1-99; canal, 2-205;

Ishtar Gate, 1-337 illus.; hanging gardens, 7-1, 1-336 illus. f.

Babylon. Egypt. Fortress built by Romans; site forms Coptic quarter in Cairo, 2-164.

Babylonia and Assyria. Anc. and of Mesopotamia, on a plain watered by the riva. Tigris and Euphrates, 1-336; Babylon, 1-335; painting, 6-33; brick-making, 2-57; musical instruments, 5-302; creation story and Genesis, 1-15; and the Zodiac, 7-524.

Bacchanalia (bakonā'li-a). Rom. festival of Bacchus, god of wine, 3-91.

Bacchantes (bakan'tez). Dancing women attending Bacchus, 3-91.

Bacchus. Rom. god of wine identified with Dionysus, 3-91.

Bacchus and Ariadne, picture by Titian, 7-283 illus.

Bach, Johann Christian (1735-82). Ger. composer, son of J. S. Bach; called "The English Bach," 1-340.

Bach, Johann Sebastian (1685-1750). Ger. composer, 1-339, 6-305.

Bach, Karl Philipp Emanuel (1714-88). Ger. musician and composer, third son of J. S. Bach, 1-340.

Bach, Wilhelm Friedrich (1710-84). Ger. composer; eldest son of J. S. Bach, 1-340.

Bachelor. Word applied to an unmarried man and to students granted the lowest degree (B.A., M.B., etc.).

Bacillus (basil'us). Micro-organism built up of rod-like cylindrical cells which multiply by division, 1-343, 344; 4-14.

Backbone (spinal column) in vertebrates, 7-394.

Backhaus, Wilhelm (b. 1884). Ger. pianist, formerly professor at Manchester College of Music.

Backwardation. See Stock Exchange Terms (table).

Bacold. Tn. in Philippine Is.; pop. 101,432, 6-156.

Bacon, Sir Francis (1561-1626). Eng. philosopher, writer, and politician, 1-340, 3-281; the New Atlantis, 1-295; works in Latin, 4-449; Neo-platonism and medicine, 5-162; founder of modern empiricism, 6-160.

Bacon, Sir Nicholas (1509-79). Father of Francis Bacon; lord keeper of the great seal during reign of Elizabeth I.

Bacon, Roger (c. 1214-94). Eng. monk and scientist 1-341, 4-149; aeroplane theories, 1-27; airship theories, 1-353; and telescope, 1-280.

Bacon and Ham, 1-341.

Bacteria. 1-343; reproduction by spores, 6-530; in plant life, 6-215; in roots of alder, 1-97; fixing nitrogen, 5-443; in cheese-making, 2-314; in disease, 4-14; attacked by leucocytes, 1-489; Pasteur's discoveries, 6-95; bacteriology, 7-195; destruction of in water, 7-426; destroyed by "silent" sound, 7-344; destroyed by ultra-violet rays, 7-344.

Bacteriophage. A virus that destroys bacteria, 1-343 illus, 344; 4-15.

Bactria. Anc. country (modern Balkh) n. of Hindu Kush Mts., famous for horses and camels; conquered by Cyrus the Great and Alexander.

BACTRIAN CAMEL

Bactrian camel, 2-184, 183 illus; 7 525 illus.

Bacup. Tn. in Lancs. Eng., on riv. Irwell. 20 m. n. of Manchester. Cotton-spinning, weaving, shoe mfrs., calico-printing; iron foundries and dye-works; pop. 18,374.

Badajoz [bad'ahóth]. Sp. City on Guadiana; pop. 43,000; taken by French (1811) and recaptured and sacked by British (1812).

Baddeleyite. See Zirconium.

Bad Ems. See Ems.

Baden [bah'den]. Former state of s.w. Ger.; mountainous and wooded, partly in Black Forest; since 1951 part of Baden-Württemberg.

Baden or Baden Baden. Ger. health resort in Baden-Württemberg at edge of Black Forest; pop. 25,000.

Baden-Powell, Robert Stephenson Smyth Baden-Powell, 1st Baron (1857-1941). Brit. general; founder of Boy Scouts, 1-345, 2-33.

Baden-Württemberg. Land of the W. Ger. Federal Republic, formed in 1951 by a merger of the Länder Baden, Württemberg-Hohenzollern, and Württemberg-Baden; cap. Stuttgart, area 13,803 sq. m.; pop. 6,640,000, 4-3.

Bader, Douglas R. S. (b. 1910). Brit. R.A.F. pilot who lost both legs in crash in 1931; squadron leader in Battle of Britain, prisoner-of-war, 1941-45; group capt. 1945.

Badger. Animal of the weasel family, 1-345; fur, 3-498.

Badges, of Boy Scouts, 2-32, 33 illus. f.; of Girl Guides, 4-24 illus. f.; as heraldic emblems, 4-165.

"Bad Lands", of Nebraska. Arid lands useless for agriculture on E. of Rocky Mts., 5-359.

Badminton. Game, 1-346.

Badminton Association, 1-346.

Badoglio [bad'ól'yó]. Pietro (b. 1871). It. soldier and statesman; commander in Abyssinia (1936); prime minister and Foreign min., 1943-44; provisional govt., 4-317, 5-311; declared war on Germany, 7-494.

Badrinath. Peak of Himalaya Mts., in the Uttar Union, India, 23,210 ft. high. On its slopes the Temple of Vishnu is visited by pilgrims every twelve years.

Baedeker, Karl (1801-59). German publisher and writer of guide books, translated into many languages.

Baelkelaand, Leo Hendrik (1863-1944). Amer. chemist, b. in Belgium. Invented "Bakelite."

Baer, Karl Ernst von (1792-1876). Ger. biologist, father of embryology; 3-240; 7-527.

Baeyer [b'ýär], Adolph von (1835-1917). Ger. chemist; won Nobel prize in chemistry (1905); synthetic indigo, 4-256.

Baffin, William (1581-1622). Eng. Arctic explorer, discovered Baffin Bay in 1615.

Baffin Bay. Large gulf of N.E. N. Amer.; 800 m. by 280 m.

Baffin Island. Barren isl. belonging to Canada; w. of Greenland; about 237,000 sq. m., 1-220.

Bagasse. Sugar cane residue, 7-181; paper made from, 6-63.

Bagshot, Walter (1826-77). Eng. political philosopher, economist and journalist; ed. *The Economist* (1860-77); wrote *The English Constitution* (1867); acute thinker with knowledge of practical affairs.

Baghdad. Cap. of Iraq; pop. 500,000, 1-346, 4-280; climate, 4-278; as anc. Arab cap., 6-131; and 1st World War, 7-181.

Baghdad Pact. Agreement made in 1955 between Iraq, Turkey, Britain, Pakistan, and Persia, 4-280, 6-311, 7-337.

Bagnères-de-Bigorre, Hautes-Pyrénées, and **Bagnères-de-Luchon**, Haute-Garonne. Fr. spas in Pyrenees, with hot springs. Pops. 8,500, 3,492, 6-314.

Bagpipe. A wind instrument, 1-347.

Bahamas. Group of islands in W. Indies. Total area 4,404 sq. m. Pop. 80,000 (86% are Negroes), 1-347.

Bahawalpur. Princely state of India, acceded to Pakistan, 4-254.

Bahia (or São Salvador). Former cap. of Brazil (1549-1763). Spt. and commercial centre; pop. 424,000, 2-48; exports, 7-96.

Bahia's Blanca, Argentina. Seaport and rly. centre; pop. 93,000; exports wheat, wool; govt. naval station, 1-223.

Bahrain Islands. Group of isls. nr. Arabian shore of Persian Gulf; ruled by native sheikh under Brit. protection; cap. Manama; petroleum and pearl fisheries, 1-191, 6-135.

Bahut. See Money (table).

Baikal, Lake. Siberia. Largest freshwater lake in Asia, 13,350 sq. m.; Trans-Siberian rly. skirts the s. shore, 7-44, 6-472.

Baille Atha Cliath. Irish name for city of Dublin.

Bailey. In feudal castles the court or area between the keep and the outer walls. Some castles had more than one bailey. In towns, bailey meant the whole space within the walls and became identified with areas of jurisdiction, hence the London Old Bailey.

Bailey bridge. To cross rivers, etc., up to 210 ft. wide without pontoons or supports; erected in about 24 hours from prefabricated panels; 10-ft. sections constructed on shore; 2-61, 1-251 illus.; invented by Sir D. Bailey for use in 2nd World War.

Baillie, Joanna (1762-1851). Scot. poet and dramatist; best known for her *Plays on the Passions* (1798-1812); friend of Sir Walter Scott.

Baily, Francis (1774-1814). Eng. astronomer; assisted in founding Astronomical Society (1820); Baily's beads, phenomena occurring during eclipses of sun, named after him, 3-157 illus. f.

Bairam. Three-day Muslim festival celebrated throughout Islam, following the fast of Ramadan; also four-day fast celebrated 70 days later, in memory of Abraham's willingness to sacrifice Isaac.

Baird, John Logie (1888-1916). Scot. pioneer of television, 7-253.

Bairns' father, Bruce (b. 1887). Brit. humorous artist and soldier; creator of "Old Bill" and author of *The Better Ole* (1917).

Bait, for fish, 3-383.

Baize. Coarse, long napped woolen or cotton cloth, used for coverings, curtains, linings. Usually green or red. Originally bay coloured. First made in Eng. by Huguenot refugees; mainly around Colchester, Essex.

Baja California. See California, Lower.

Bajazet. See Bayazid I.

"Bakelite". Proprietary name of a synthetic resin made of phenol and formaldehyde, 6-219.

Baker, Sir Benjamin (1840-1907). Eng. engineer, associated with the building of the Forth Bridge and Aswan Dam.

Baker, Sir Herbert (1862-1946). Eng. architect; in S. Africa designed Groote Schuur, Govt. House (Pretoria) and Rhodes Memorial; also architect for Bank of England, New Delhi, etc.; 1-362, 3-64.

Baker, Sir Samuel White (1821-93). Brit. explorer, discoverer of Albert Nyanza, 1-347, 1-51.

Bakewell, Robert (1725-95). Farmer of Dishley, Leics. who established scientific stock-breeding, 1-78; and Leicester sheep, 7-22.

Bakewell. Tn. in Derbyshire, Eng., on riv. Wye; famous for warm springs; Bakewell tart originated here; pop. 3,350.

Baking. In cookery, 2-197. bread making, 2-52; Etruscan bakery, 2-50 illus.

Baking powder. Chemically prepared substance with a similar action to yeast.

Bakat Leon Nikolaievitch (1886-1924). Russ. designer of stage settings and costumes.

Baku, Cap. of Azerbaijan S.S.R. Pop. 809,310, 1-348, 6-172; 6-477; oil seepage pool, 6-148 illus.

BALI

Bakunin, Mikhail (1814-76). Russ. anarchist and revolutionary. Aristocrat by birth, he preached destruction of central state power by mass insurrection. Imprisoned 7 yrs. in Siberia; Marx's unsuccessful rival in First International.

Bala. Tn. in Merionethshire, Wales, on riv. Dee at N. end of Bala Lake; pop. 1,508, 5-175.

Bala. Lake in Merionethshire, Wales; 4 m. long and 3 m. broad; 5-175.

Balaam. Prophet disobedient to divine command until miraculously rebuked by his ass; compelled against his will (Num. xx-xxiv) to bless Israel.

Balaclava, battle of (1854), 1-348.

Balakirev, Mili Alexievich (1837-1910). Russ. composer, 5-306.

Balance or Scales (Libra). One of 12 signs of the Zodiac, 7 illus., 524.

Balance, in watches, 2-381.

Balance, sense of, 3-117 diag., 118.

Balance of Power. Diplomatic term for the principle of maintaining an equilibrium between states or groups of states by means of alliances so that no one state can become predominantly powerful.

Balaton. Lake in Hungary; area 250 sq. m.; discharges into the Danube, home of many rare birds.

Balbo, Italo (1896-1940). It. statesman and aviator; led formation flights over Atlantic in 1931 and 1933. Gov. of Libya, 1933. Killed in aeroplane accident (shot down by It. anti-aircraft) in 1940.

Balboa, Vasco Núñez de (c. 1475-1517). Span. explorer, 1-348; discovered Pacific Ocean, 6-29, 1-133.

Balboa. Port of Panama City, Cent. Amer. Under U.S. rule; harbour has floating cranes, coaling plant, oil storage tanks and a dry dock.

Balboa. See Money (table).

Balbriggan. Cotton goods, hosiery, etc., made of fine unbleached fibre; named after Irish town where first made.

Balder. In Norse myth., god of light, 1-349.

Bald-headed eagle, 3-147 illus.

Baldock. Tn. in Herts, Eng., 5 m. N.E. of Hitchin on Great North Road; hosiery mfrs.; pop. 5,907.

Baldovinetti (1425-99). It. painter, teacher of Ghirlandajo, 4-318.

Baldwin I (1038-1118). Adventurer prince of First Crusade, first king of Jerusalem; crowned 1100; brother of Godfrey of Bouillon 3-1.

Baldwin, Robert (1801-58). Canadian statesman; the champion of responsible govt.

Baldwin of Bewdley, Stanley Baldwin, 1st Earl (1867-1947). Brit. Conservative statesman. M.P. from 1908; succeeded Bonar Law as premier 1923; premier again 1924-29, and 1935-37. Astute politician, he handled General Strike and Edward VIII's abdication with skill, but failed to anticipate German menace.

Bale. See Basle.

Balearic Isles. Group of isls. in Mediterranean belonging to Spain. Total area, 1,930 sq. m. Pop. 136,127. 1-349, 7-103.

Baleen (or whalebone), obtained from whale species, 7-115.

Baleen whale, 1-161.

Balle, Michael William (1808-70). Irish composer; wrote *Bohemian Girl* and other light operas; song music, "Killarney," "The Arrow and the Song," etc.

Balfour, Arthur James Balfour, 1st Earl of (1848-1930). Brit. Conservative statesman and philosopher; M.P. from 1874; able, sometimes ruthless, sec. for Ireland, 1887-90; premier 1902-06; resigned leadership of Cons. opposition 1911; foreign sec. 1916-19; Balfour Declaration, 4-302.

Balfour Declaration (1917). Issued by Lord Balfour, on the future of the Jews in Palestine; terms of, 4-302.

Bali [bah'li]. Isl. of Indonesia, E. of Java; 2,160 sq. m.; exports rice, cocoa, coffee, 4-257; temple dancers, 3-37 illus.

BALIK PAPAN

Balik Papan. Oil pt. on s.e. coast of E. Borneo (former Dutch Borneo).

Ballila. It. Fascist organization of boys from 6 to 12 years of age, started in 1926, disbanded 1913, 3-312.

Balliol (bali'yo), John de (1249-1315). King of Scot., son of the founder of Balliol College, Oxford; claimed Scot. throne on death of Margaret (1290) and became king (1292); invading Eng., he was forced to surrender to Edward I, 2 96.

Ballistapus aculeatus. Tropical fish, 5-128 illus. f.

Balk, in lumbering, 5 19.

Balkan Entente. A pact of regional understanding signed in Feb. 1934 between Greece, Rumania, Turkey and Yugoslavia.

Balkan Mts., in the Balkan Peninsula, an extension of the Carpathians, beginning at Iron Gates of Danube, extend s. through Serbia, then turn sharply e. to Black Sea; highest point mt. Yumukchal, 7,786 ft., 1-349; minerals, 2 120.

Balkan Peninsula, s.e. peninsula of Europe, 1-349; and 1st World War, 7-183.

Balkan Wars (1912-13), 3-316; and Macedonia, 5 63; Gk. gains, 4 78; Rumanian gains, 6 470; growth of Serbia, 6 532; bombing by aircraft, 1-511.

Balkash. Salt lake in Kazakhstan, near Chinese border; 330 m. long; no outlet; 11th largest lake in Eurasia, 6 172, 478.

Balkh. Dist. of Afghanistan between Hindu Kush Mts. and Amu-Daria r.; anc. Bactria.

Ball, John (d. 1841). A leader in Wat Tyler's Rebellion, 3-477 illus.

Ball, cricket, 2 528; soccer, 3-415; golf, 4 46; hockey, 4-184; hurling, 4 211; lacrosse, 4 435; rugby, 3 116; tennis, 4 460.

Ballad. Form of traditional poetry, usually narrative, simple in style, limited to a single episode, 1-350; 6 245.

Ballantyne, Robert Michael (1825-91). Scot. author of more than 80 books for boys, including *Coral Island*; was in service in Hudson's Bay Co., 1841-47, 2 356.

Ballarai, Australia, 3rd city of Victoria; pop. 42,600.

Ballast. Gravel, stones, metal or water (in tanks), carried in boat or ship to keep it stable when cargo is not sufficient to give it deep draught in the water.

Ball bearings. See Bearings.

Ball-clay, as type of clay, 2 406.

Ballad. The art of telling a story by gestures and dancing, 1-351.

Ballin, Albert (1857-1918). German-Jewish shipping magnate; gen. director of Hamburg-Amer. steamship line.

Balliol, John (King of Scots). See Balliol.

Balliol College, Oxford; foundation, 6 17; arms, 4 165 illus. f.

Ballistics. Science of projectiles; and artillery development, 1-258; and police college, 6-248 illus.

Balloon, 1-353; meteorological, 5 178 illus.; hydrogen in, 4-222; and jet propulsion, 4-368, 370 illus.

Ballot. System of voting, 1-356.

Ball-point pens, 6-112; ink used in, 4 262.

Balm. A fragrant herb of the mint family, also a balsam.

Balmat, Jacques (1762-1834). Guide to M. Pacard on first ascent of Mt. Blanc, 1 126.

Balm of Gilead. An aromatic resin obtained from a small oriental evergreen tree belonging to myrrh family.

Balmoral Castle. Royal residence on the Dee, in Aberdeenshire, Scot., 1 356.

Balsa. Extremely light, pithy wood used in model aircraft construction, refrigerators, etc.; the balsa tree (*Ochroma lagopus*) is a native of tropical S. America; is also called corkwood.

Balsam fir. Tree; resin from, 3-365.

Balsams, various mixtures of volatile oils and resins exuded by trees; used in perfumes, and medicinally for bronchial complaints.

Balsas River, in S. Mexico, flows 130 m. w. to Pacific.

Baltic Provinces. Collective name of former Rus. provinces of Courland, Livonia, Estonia; became separate states, and later republics of the U.S.S.R.

Baltic Sea. Inland sea of Europe, 1 357; Hansatic tns., 4 129.

Baltic-White Sea Canal, U.S.S.R. Opened 1933, linking Leningrad with Belomorsk on White Sea, is 141 m. long, and saves voyage of 3,000 m. round Norway.

Baltimore, George Calvert, 1st Baron (c. 1580-1632). Founder of Avalon colony of Newfoundland (1621); applied for charter for Maryland which was granted after his death to his son Cecilius; Baltimore named after, 1-358.

Baltimore. Spt., cap., and largest city of Maryland, U.S.A.; pop. 940,205; 1-357.

Baluchistan (baloo'chistahn). Prov. of Pakistan; area 134,000 sq. m.; pop. 1,178,000, 1-358, 4 239, 6-11.

Balzac, Honoré de (1799-1850). One of the greatest and most prolific of Fr. novelists, 1 358; 5 172; 3 156.

Bamangwato. Tribe of the Bechuana, living in Bechuanaaland protectorate, S. Africa; about 101,000 people; cap. Serowe.

Bamberg. City of Bavaria, w. Ger.; pop. about 18,000; 11th cent. cath.; large breweries, cotton and woollen mills.

Bamboo. Evergreen, tree-like grass, native to Asia, Africa, America, 1-359; importance in China, 2 361; in Japan, 4 342; paper made from, 6 63.

Bamburgh castle, Northumberland, Eng., 5 161 illus.

Bamian. Valley and pass in Afghanistan 60 m. s.w. of Kabul; colossal Buddhist idols carved in rock.

Banana. Perennial plant, family *Musaceae*, native to tropics, 1 359.

Ban at Temesvar. Fertile dist. lying between Danube and Theiss rivs. and Transylvanian Alps; 11,000 sq. m.; formerly part of Hungary, now divided between Rumania and Yugoslavia.

Banbury. Market tn. in Oxfordshire; old "Banbury Cross" demolished in 1610, replaced by modern one; famous for pastry cakes containing mince meat, and as centre of Puritanism in 17th cent., whence "cakes and ale"; aluminium manufactures, agricultural implements, surgical appliances, etc.; pop. 18,917, 6 22.

Banchory. Tn. Kincardineshire, Scot., noted for shortbread; pop. 1,958, 4 404.

Bancroft, George (1800-91), American historian, 7-365.

Bancroft, Sir Squire (1841-1926). Brit. actor-manager. During 1880-85 was joint manager with his wife, Marie Effie Wilton, of the Haymarket theatre, producing and appearing in plays by Robertson, Sardou, and Pinero.

Banda. Group of 12 small volcanic isls. in the Moluccas, republic of Indonesia, 60 m. s. of Ceram. Area 18 sq. m.; pop. 10,000. Spices are grown.

Bandage, in first aid, 3-365.

Bandar. See Masulipatam.

Bandar Abbas, Persia. Spt. on Strait of Ormuz, Persian Gulf; pop. 9,000; exports fruit, tobacco, wool, carpets, opium.

Banda Sea, in Malay Archipelago, s. of Isl. of Ceram and N. of Timor.

Banderillas. Thrower of banderillas (darts 18 in. long) in bull-fighting, 2 122.

Bandicoot, burrowing marsupial; rat-like, size up to that of a rabbit, 5-137.

Bandong (bandong'g). Tn. of Java, Rep. of Indonesia; seat of govt. and

BANQUE DE FRANCE

of Allied command after Jap. invasion; in Jap. hands March 1942 to Aug. 1945; prosperous commercial centre of W. Java; pop. 167,000; 4 355.

Bandon. Riv. in Irish Rep., flowing to Kinsale Harbour; 42 m. long, 4 281.

Band-saw, in lumbering, 5 50 illus., 51.

Bandy. Welsh game resembling hockey, 4-184, 4 232.

Banff. Spt. and co. tn. of Banffshire, Scot.; pop. 3,359, 1 361.

Banff National Park, Alberta, Canada, 1-91; 2 196 illus. f.; 6 425 illus.

Banffshire. S.e. maritime co. of Scot.; area 630 sq. m.; pop. 50,135; co. tn. Banff; 1 361.

Banga-Bhassa. See Bengali.

Bangalore. Admin. cap. of Mysore state, Rep. of India; pop. 248,334; aircraft, silk, woollens made; 4 241.

Bangkok. Cap. of Siam; pop. 884,000, 1-361; Buddhist temple, 7-15 illus.

Bangor. Old cath. city on coast of Wales, in Caernarvonshire; pop. 12,822; seat of bishopric since 6th cent.; University College of N. Wales; slate quarries, 2 160.

Bangor. City and port of Maine, U.S.A., on riv. Penobscot; a lumbering centre; shipbuilding, flour-milling, boots and shoes, clothing, machinery; pop. 31,558.

Bangweulo or Bangweulu Lake, in N. Rhodesia, 150 m. long, 6 394; formed by head streams of Congo; discovered by Livingstone, 4 527.

Bani. See Money (table).

Banjermasin. Chief tn. in former Dutch Borneo, built chiefly on piles; pop. 70,000; exports spices, gold, precious stones, drugs.

Banjo. Musical instrument, 1 361.

Bankers' Clearing House, 1 364.

Bank for International Settlements. Estab. at Basle, Switzerland, in 1929, under the Young Plan, primarily to furnish means for distribution of Ger. reparations; later acted as foreign exchange reserve of central banks, 1 380, 3 419.

Bank Holidays, in United Kingdom, 1 329, 4 187; Lubbock and, 1 329.

Bank notes, origin of, 5 236; issued in Gt. Brit., 1 362, 363.

Bank of England. Eng. central bank founded in 1694, as a joint stock concern, 1 361, 5 20; and Bankers' Clearing House, 1 364; artisan well, 1 255.

Bank-rate, 1 365.

"Bank return", 1 362.

Bankruptcy, 1 363.

Banks and Banking, 1 363; money, 5 236; Quakers and, 6 317; night safes, 6 181; banking as a career, 2 232.

Banks, Sir Joseph (1713-1820). Brit. naturalist; accompanied Capt. Cook as botanist on his voyage round the world. Gave his name to Banks Isl., and Banks Strait, and the flower, Banksia; and Botany Bay, 1 317.

Banksia rose, 6-453.

Banksia. S. bank of Thames at Southwark.

Banks Island, Arctic Circle, 1-220.

Bann. Rivers (Upper and Lower) of Northern Ireland. Valuable salmon fisheries. Upper Bann, 25 m. long. Lower Bann, 33 m. long; 5 31.

Banners, of St. George (England); St. Andrew (Scotland); St. Patrick (Ireland); these, superimposed, make up the Union Jack, 7 346.

Bannister, Roger (b. 1929). Brit. athlete and Oxford running blue. British record for mile, 4 min. 3.6 sec. (1953). Member of Brit. team which broke world record for 4 x 1 mile relay at White City in 1953. First in world to run mile in under 4 minutes (3 min. 59.4 sec., 1951).

Bannoockburn, battle of (1314), 1-365, 7 158; 3 167; 6 512.

Banns, of marriage, 5-135.

Banque de France. Central bank of France, founded by Napoleon in 1800. Only the 200 largest shareholders could attend the annual meeting; came under state control, 1936; nationalised, 1946.

BANSHEE

Banshee. In folk lore of Ireland and W. Highlands of Scot., a female fairy who gives warning by wailing sounds of approaching death.

Bantam. Spt. of Java, gave name to bantam fowls.

Banting. Sir Frederick Grant (1891-1941). Canadian doctor who discovered insulin, a relief for diabetes. 4-270, 2-204; 5-103 illus.

Banting, William (1797-1878). Brit. dietitian; discovered a method of slimming; his name gives "to bant," meaning "to slim by dieting."

Bantock, Sir Granville (1868-1948). Brit. composer and conductor, chiefly noted for many fine choral works, esp. *Omar Khayyam* and *Atlantica in Ceydon*.

Bantry Bay. Inlet of co. Cork, Irish Repub., noted for its beauty. In 1689 and 1796 it was the scene of French attempts to invade Ire., and in 1697 William III's troops landed here.

Bantu. Group of tribes in Cent. and S. Africa, including Kaffirs, Zulus, Hottentots, Basutos, 4-100, 7-89 illus. f.; languages, 1-51.

Banyan. Tree of the fig family, 1-365.

Baobab. Tree native to Africa, Australia. Leaves resemble those of horse chestnut. Has white flowers 6 in. across, followed by woody fruit filled with pulp, known as monkey bread. Rope made from fibrous bark; 7-313.

Bao Dai. Emperor of Annam (1926-45). Invested as head of state of Vietnam, Indo-China, in 1949, 7-400.

Bapaume. Tn. in Fr. 15 m. S.E. of Arras; battle in Franco-Prussian War (1871), 3-459; and 1st World War, 7-443.

Baptism. Rite of initiation into the Christian Church, 1-366.

Baptists. Protestant denomination which holds that baptism should be by immersion; world membership about 1,200,000; 3-404, 2-381; baptism, 1-366, 3-404.

Bar. In Eng. legal system, the whole body of advocates, 1-377.

Bar (music). See Musical Terms (table).

Barabbas. A robber released by Pilate on demand of Jews when Jesus was condemned.

Barada. Riv. of Syria; at Damascus, 3-34.

Barbados. Easternmost isl. of Windward Is., Brit. W. Indies; area 116 sq. m.; pop. 206,000; cap. Bridgetown, 1-366.

Barbara. Christian martyr of 3rd cent., was beheaded in public by her own father, who was immediately struck dead by lightning.

Barbarossa. See Frederick I (Holy Roman emp.).

Barbarossa, Khair-ed-Din. Turkish pirate who terrorized Mediterranean in 16th cent.

Barbary ape. Type of monkey found in N.W. Africa and Gibraltar, 5-241.

Barbary coast. N. Africa, pirates 5-260, 6-206.

Barbary sheep. See Aoudad.

Barbary states. Region of N. Africa inhabited by Berbers; includes Morocco, Algeria, Tunisia and Libya; centre of corsairs, 1-110.

Barbastele. Rare Brit. bat, 1-381 illus.

Barbecue. Term used in N. Amer. for a meal at which meat is cooked in the open air.

Barbed wire. 7-162-63 with illus.

Barbel. Fresh water fish related to the carp. Common in some Brit. rivers. Has four barbels hanging from upper jaw; length up to 2 ft.; brown above with green lustre, yellowish green on sides, abdomen white.

Barber Institute of Fine Arts. Birmingham Univ., 1-474.

Barber of Seville. The. Opera by Rossini; story, 6-516.

Barberry, plant; and rust fungus, 6-481.

Barbroll, Sir John (b. 1899). Brit. musician; conductor of the New York Philharmonic, 1937-42, and then the Hallé orchestra, Manchester; knighted 1949.

Barbiturate. Class of dangerous drugs, small doses of which steady the nerves and induce sleep.

Barbizon school of Fr. landscape painters. 3-440, 2-512.

Barbour, John (c. 1316-95). Scot. poet, famous for his patriotic epic *The Bruce*, 6-514, 3-284.

Barbuda. One of Leeward Is. in Brit. W. Indies, 63 sq. m.; pop. 903.

Barcelonnette. See Musical Terms (table).

Barcelona. Prov. chief spt. and second largest city of Spain; pop. (city) 1,285,900, (prov.) 2,226,700, 1-367; exhibition, 3-328; industries, 7-104.

Barcelona nut. 4-143.

Barcelon (anc. name). See Barcelona.

Barclays Bank. as Quaker firm, 6-317.

Bardara. Tn. in It. Somaliland, 7-84.

Bardia. Spt. in Libya, 12 m. from Egyptian frontier; imp. base in N. African campaign of Second World War; changed hands 5 times between 1940 and 1942; 7-190 illus.

Bards. poets and minstrels; in Welsh hist., 3-207.

Barilly, India. Trade centre in Uttar Pradesh; pop. 192,000, massacre of Europeans in mutiny of 1857.

Barrens, William (d. 1597). Dutch explorer; discovered Spitzbergen; perished attempting to discover the N.E. passage to Asia.

Barfush or Babal. A trading tn. in Persia, on Bahhul r.; pop. 30,000; rice, cotton, silk.

Barge. Originally a small sailing vessel; now a flat-bottomed cargo-boat used on inland waterways and close inshore; canal barge, 2-201 illus. f.; sailing barge, 7-33 illus.; on the Mississippi, 6-226 illus.

Bargeboard. A board placed at a gable to conceal the roof timbers.

Barl (bah'rel). Spt. in S.E. It. on Adriatic; pop. 273,143; anc. Barium; broadcasting str.; 4-304.

Barilla. Annual plant native to N. Africa, Asia Minor Spain Grows close to shore. Height 12 in. Ash of burnt plant yields soda, formerly used in making soap, glass.

Barling. Family of Eng. financiers and bankers. See Cromer.

Baring-Gould, Sabine (1834-1924). Brit. author and cleric; his extensive knowledge of folklore in w. of Eng. is shown in his novels; wrote "Obward, Christian Soldiers," 4-226.

Baritone. in singing, 7-57.

Barium (Ba). Dense metallic element of the alkaline earth metal group; atomic weight, 137.36; occurs in the mineral sulphate-barytes; 3-224; hydroxide, 1-112; in X-ray examination, 7-507.

Bark. Waterproof protective covering of trunks and branches of trees and shrubs; and cork formation, 2-505.

Bark beetle. a tree pest, 1-415 illus.

Barker, Sir Ernest (b. 1874). Brit. scholar, professor of political science at Cambridge Univ., 1928-39. His writings are marked by an essentially liberal spirit.

Barker, Sir Herbert Atkinson (1869-1950). Specialist in manipulative surgery.

Barking. Bor. of Essex; suburb of London; pop. 78,197; has one of the largest power stations in Gt. Brit., 6-27.

Barking-deer. See Muntjac.

Barle. Riv. of Somerset, Eng., 7-84.

Barley. Annual, grain-producing plant of the grass family, 1-368; malt, 5-97; harvest, 4-134; rust fungus, 6-481 illus.; cell arrangement in root, 2-287 illus.

Barleycorn. Anc. measure of length, 1-389 7-435.

Barleycorn, John. Personification of intoxicating liquors.

Barley sugar. 7-186.

Barmecides. Persian family, powerful under early Abbasid caliphs (8th cent.); "Barmecides' feast," meaning an imaginary banquet, comes from the "Arabian Nights," where a Barmecide jests at a hungry man's expense by placing empty dishes before him.

BARQUE

Barmen. See Wuppertal.

Barmouth. Holiday resort, Merionethshire, Wales; pop. 2,466, 5-175.

Barnebas. Christian saint, ranking as apostle. A converted Levite from Cyprus, named Joseph and surnamed Barnebas. Worked with St. Paul at Antioch. Festival, June 11.

Barnacle. Sea creature, with shell, 1-369.

Barnacle goose. A sea bird, 4-47; superstition concerning, 1-369.

Barnard, Frederick (1846-96). Brit. illustrator, remembered chiefly for his many fine drawings for Dickens' works.

Barnardo, Thomas John (1815-1905). Brit. philanthropist, founder of Dr. Barnardo's Homes, 1-369.

Barn dance. Ballroom dance introduced into Eng. from U.S.A. about 1896, 3-37.

Barnes, Ernest William (1874-1953). Bishop of Birmingham 1924-53; upholder of scientific outlook; wrote *Scientific Theory and Religion*; 1-174.

Barnes, Sidney Francis (b. 1873). Eng. cricketer, considered one of the greatest bowlers of all time. Played for Warwickshire and Lancs. before playing for Staffs, 1904-27. See also Cricket Records.

Barnes, William (1801-86). Dorset dialect poet, 3-108.

Barnes. Mun. bor. of Surrey; pop. 40,558; Barnes Common is a large open space, 5-27.

Bar-net. Market tn. of Hertfordshire 11 m. N. of London, pop. 25,017; scene of Yorkist victory over Lancastrians in 1471; important horse fair held annually.

Barnett, Rev. Samuel Augustus (1841-1913). Brit. social reformer. Founder of Towns Hall. Originated Children's Country Holiday Fund. With his wife, Henrietta Octavia Rowland (1851-1936), wrote *Practical Socialism*.

Barnveldt, Jan van Olden (1547-1619). Dutch statesman; secured Twelve Years' Truce with Spain, 1609 unjustly beheaded for treason.

Barn-owl. 6-12; egg, 1-452 illus. f.

Barnsley. Mfr. tn. in Yorkshire; pop. 75,025; coal fields; mfrs. include iron, steel, looms, glass bottles, paper, linen, clothing.

Barnstaple. Spt. of Devon at head of Taw estuary, 40 m. N.W. of Exeter. Mfrs. include furniture, lace, glove and pottery; pop. 18,603.

Barnstaple Bay. Inlet on the north Devon coast. Also called Hideson Bay.

Bar-num, Phineas Taylor (1810-1891). Amer. showman; called his travelling circus "The Greatest Show on Earth"; introduced Gen. Tom Thumb, Jenny Lind, etc., to the public, 2-405; and Jumbo, 3-225.

Barnyard grass. 4-100.

Baroda. India. Trade and rly. centre in K. cent. India. Pop. 153,300. Cap. of native state of same name ruled by the Gackwar of Baroda until his 1948 reforms were rejected and Baroda state was merged in Bombay state, 1949, 1-415.

Barograph. and atmospheric pressure, 1-371.

Baroja (bahro'hah) Pio (b. 1872). Spanish novelist, 7-122.

Barometer. 1-370; and air pressure, 1-80.

Baron. in Brit. peerage, 6-406.

Baronet. An inheritable title in Gt. Brit. ranking next below that of a baron; the highest degree of honour borne by commoners; abbreviated Bt. or Bart.; Rebellio led by Simon de Montfort against Henry III of Eng., 4-162.

Barotseland. A native reserve in Rhodesia, 6-394.

Barouche. Four-wheeled carriage drawn by two horses, used in Euro. 18th-19th cents. Seated two couples facing each other.

Barque. Sailing vessel with three, four or five masts. Square rigged on

BARRA

masts except aftermast, rigged fore-and-aft.

Barra, Isl. of Outer Hebrides, Inverness-shire, Scot. Area 34 sq. m.; fishing and cattle-rearing; pop. 2,500.

Barraek-room. Ballads. Verses by Rudyard Kipling. 4-413.

Barrage, a form of dam. 3-30, 32.

Barrage balloons, 1-353 illus. f., 1-355 illus.

Barramunda. Australian lung-fish. 5-51.

Barranquilla. Spt. of Colombia, on Magdalena 17 m. from mouth; pop. 202,760; terminus of river traffic; exports coffee, hides.

Barras (bar'ah), Paul, Comte de (1755-1829). Fr. statesman, member (1795-99) of Directory.

Barré Plymouth Rock. Breed of poultry. 6-277 illus. f.

Barrett, Elizabeth Moulton. See Brown-ling, E. B.

Barrett, Wilson (1846-1904). Brit. melodrama actor and dramatist. Staged *The Silver King* and *The Sign of the Cross*.

Barthead. Industrial tn. in Renfrewshire, Scot.; pop. 12,971, 6-388.

Barrias (bar'iah), Louis Ernest (1841-1905). Fr. sculptor; "The First Funeral"; "Victor Hugo" monument in Paris.

Barrie, Sir James Matthew (1860-1937). Scot. novelist and dramatist. 1-372, 3-291; *Peter Pan*, 2-354.

Barrier Reef, Great. Formation of coral reefs, about 1,200 m. long, off N.E. coast of Queensland, Australia. 6-322; 2-504.

Barriester. In Eng. and Ireland, one called to the bar by one of the Inns of Court. 1-377; appointment as judges, 2-522; training for a career 2-232; and saving "Queen Anne's dead," 1-159; wig and gown, 4-459 illus.

Barrow. Ancient burial mound. Long barrows are typical of the Stone Age, and round barrows of the Bronze Age.

Barrow. Riv. of Ireland, rises in Slieve Bloom Mts. and flows 120 m. to Waterford Harbour. 4-281.

Barrow, Isaac (1630-77). Celebrated mathematician and divine, tutor to Sir Isaac Newton.

Barrow-in-Furness. Spt. and industrial tn. in Lancs, England; pop. 67,473; engineering, smelting, iron and paper works; shipyards; 4-444.

Barry, Sir Charles (1795-1860). English architect; designed Houses of Parliament at Westminster.

Barry. Spt. of Glamorganshire, with large docks (114 acres) and three large graving docks. Coal export centre. Pop. 40,979.

Barrymore. Surname of a famous American theatrical family. Lionel Barrymore (b. 1878), John Barrymore (1882-1942), and Ethel Barrymore (b. 1879) all acquired a great reputation on stage and screen.

Barter. Method of exchange of goods, used before money became common. 5-234.

Barth, Heinrich (1821-65). Ger. explorer; explorations in Africa. 1-34.

Barth, Karl (b. 1886). Swiss theologian. Professor of theology, Univ. of Basle, 1935. Works include *I as Wort Gottes* and *die Theologie* (Theology and the Word of God), *Die Auferstehung der Toten* (Resurrection of the Dead).

Bartholdi, Frederic A. (1834-1904). Fr. sculptor; Statue of Liberty. 5-413.

Bartholomew, St. One of the twelve disciples of Jesus Christ. Festival, Aug. 24; 1-184.

Bartholomew Fair. London fair held at Smithfield. 1190-1855, until 1751 on St. Bartholomew's Day (Aug. 24). After change in calendar was held on Sept. 3. Once the chief cloth fair in Eng. 3-338.

Barthou, Louis Jean Firmin (1862-1934). Fr. foreign minister who was assassinated in company of King Alexander of Yugoslavia at Marseilles in 1934.

Barthizan. In architecture, a small

overhanging turret, with loopholes, projecting from the top of a tower.

Bartle Frere, Mt. Highest point in Great Dividing Range, Australia (5,438 ft.). 6-324.

Bartok, Bela (1881-1945). Hungarian composer and pianist. Works include *Bluebeard's Castle* (opera), *The Word and the Deed* (ballet), violin concerto, string quartets, concerto for orchestra, 4-206, 5-306.

Bartolommeo (bah'tolom'ē), Fra (1475-1517). One of the great painters of the Florentine Renaissance. Works include "St. Mark" now in Pitti Palace. "The Presentation in the Temple," at Vienna, etc.

Bartolozzi (bah'tolot'si), Francesco (c. 1727-1815). Italian engraver. One of the original painter members of the Royal Academy. Mainly adopted stipple method, and left over 700 engravings.

Bart's. London hospital. See St. Bartholomew's Hospital.

Baruch. Apocryphal book of Old Testament.

Baruch, Bernard M. (b. 1870). Amer. economist; U.S. delegate to U.N. atomic energy commission; submitted proposals for international atomic control in 1946.

Barye, Antoine Louis (1796-1875). Fr. sculptor of animals; Bronzes include the celebrated "Jaguar Devouring a Hare" at the Luxembourg, "Lion Seated" in the Tuilleries garden, etc.

Barysphere. Shell enclosing core of the earth; composition, 3-150.

Basalt. A fine-grained, heavy igneous rock often solidified into prismatic columns.

Bascule bridge, 2-68 with illus.

Baseball. National ball-game of the U.S.A., 1-377.

Basel. See Basle.

Bases, in chemistry, term applied to the oxides or hydroxides of metals which combined with acids form new bodies known as salts, 1-11.

Ba'shan. Rich dist. in anc. Palestine, beyond the Jordan; famed for cattle of great size ("bulls of Bashan").

Bashkir. Autonomous republic of the R.S.F.S.R. Lies between Tartar republic and Ural. Ufa cap. on Belaya r. Rich oil deposits.

Bashkirtsev (bashkér'tsef), Marie (1860-84). Brilliant versatile Rus. painter and author; famed through her *Journal*.

Basic English. System devised by C. K. Ogden to make English serve as an international language by restriction of vocabulary to 850 words. In 1946 its copyright was assigned to the Brit. crown by its inventor for £23,000. Bible published in Basic, 1949.

Basic slag. A combination of lime and phosphorus, used as fertilizer. 4-294.

Basidiomycetes (basid'iomis'etéz). Class of fungi with spores borne on the outside of special cells, 3-489.

Basil, St. (329-79). Christian saint and bishop, father of the Church and founder of Eastern monasticism; rule of monks, 5-243.

Basil I, The Macedonian (867-886). See under Byzantine Empire (rulers).

Basil II (963-1025). See under Byzantine Empire (rulers).

Basil. Annual aromatic plant, family Labiales. Native to tropical Asia. Some species cultivated in Brit. Leaves used for flavouring salads, soups, stews.

Basileia. Originally a hall of justice among the Greeks and Romans. In the early days of Christianity churches were given the same general plan, that of an oblong building with a nave, aisles, apse, narthex, and sometimes a transept, 1-210.

Basiliata. Dist. of S. Italy. 4-304.

Basilik. Fabulous snake-like creature of antiquity, popularly imagined to be king of the serpents, from the crest on its head.

Basinstoke. Tn. in Hants, Eng.; pop. 16,979; important rly. junction.

BATES

Agricultural trade; mfrs. incl. motor vehicles, farm implements, beer, clothing; 4-123.

Baskerville, John (1706-75). Brit. printer; printer to Cambridge univ. 1758-68. Created Baskerville type; associations with Birmingham. 1-474.

Basket-ball. Game. 1-378.

Basketry and Wickerwork, 1-378; Red Indian, 6-373 illus.; Zulu, 1-63 illus.

Basking shark. Variety of shark, 7-18.

Basle. Tn. in Switzerland, pop. 183,742. 1-380, 7-213 illus.

Basques. People inhabiting Basque provs. N.E. Spain and S.W. Fr., 7-103.

Basra. Tn. and port of Iraq on Shatt-el-Arab; pop. 62,000, 4-278.

Bas-relief. Carving in which the figures stand out slightly above the surface of the stone, Babylonian, 1-338 illus.

Bass (bäs). The lowest part in musical compositions; the deepest male voice in a choir, 7-57.

Bass (bas). Fresh-water and salt water fishes, 1-380.

Basanio. Character in Shakespeare's *A Merchant of Venice*, 5-173.

Bassano, Italy; Palladio's truss bridge. 2-63 illus.

Bassein (basin'), Burma. Trading tn. and port in delta of Irrawadi r., 90 m. from sea; pop. 43,000; mills and exports rice.

Bassenthwaite Water. Lake in Cumberland, Eng. 4 m. long, 4-439.

Basse-Terre. Cap. of Guadeloupe, Fr. W. Indies; pop. 10,086, 4-101.

Basset hound. Dog of Fr. origin, formerly used for hunting hares, 3-102, 101 illus. f., 4-209.

Bassianus (Roman emp.). See Caracalla.

Bassoon. Wooden double-reed instrument, 5-307, 7-173.

Bass Rock. Isl. off coast of East Lothian, Scot., volcanic in origin; area 7 acres; 350 ft. high. Has a lighthouse and is the home of many seabirds, esp. gannets, 5-40.

Bass Strait. Channel between Australia and Tasmania. About 195 m long; greatest breadth 140 m.; many is. and coral reefs; named after Dr. George Bass, who sailed through it in 1798.

Basswood. Amer. species of lime; timber from, 4-509.

Bast. Fibrous bark of basswood tree, used for tying garden plants, making mats, etc., 4-509.

Bastia. City and port of Corsica, on N.E. coast 98 m. by rly. from Ajaccio; pop. 49,327, 2-512.

Bastille (basti'). Prison fortress in Paris, built in 1369 to protect palace of Charles V; destroyed by mob at outbreak of Fr. Rev., 3-167; and Voltaire, 7-106.

Bastinado. Method of torture by beating the soles of the feet.

Bastogne (bastön). Tn. of the Ardennes, Belgium, 5 m. from border of Duchy of Luxembourg; held Dec. 18-26, 1944, by the U.S. 101st Airborne Div., against constant attack by superior forces and completely surrounded during Rundstedt's Ardennes offensive.

Basutoland. Brit. protectorate, S. Africa, N.E. of Cape of Good Hope; 11,716 sq. m.; pop. 563,854; 7-88, 89; Basutos, 1-51.

Bat. A winged mammal. 1-380; hibernation, 4-173; anatomy of wing, 4-125 illus., 5-100; instinctive behaviour, 1-151, 154.

Bat, cricket, 2-528.

Bata, Thomas (1876-1932). Czech shoe manufacturer who founded a great factory at Zlin; later there were Bata factories and shops in many countries.

Bataan (batahn') Peninsula. Headland of W. Luzon, Philippine Is.; attacked by Japanese Dec. 1941, held by Americans until April 9, 1942; retaken Jan. 9-Feb. 15, 1945.

Batalha. Tn. in Portugal; monastery. 6-268, 269 illus.

Batavia (Java). See Jakarta.

Batch bread, 2-52.

Bates, Henry Walter (1825-92). Brit. naturalist; on the warrior ants, 4-286.

BATH

Bath. City of Somerset, Eng., on riv. Avon; pop. 79,275, 1-383, 7-84; hot springs, 7-139.
Bath, Order of the. Order of knighthood, 5-330, 4-417.
Bath. See **Weights** (table).
Bath chair. Invalid chair; originated at Bath, 1-381.
Bathing. 1-384; Regency vogue at Brighton, 2-70; bathing machinos, 1-385 illus.
Bath of purification. In ceremony of knighthood, 4-417.
Baths, Roman. 6-429 illus. f.; at Bath, 1-383, 384 illus.; in olden times, 7-425.
Bathsheba. Wife of Uriah the Hittite; David later married her (2 Samuel xi); mother of Solomon.
Bath stone. Building material quarried near Bath, 1-384, 4-510.

Bathurst. Spt. and cap. of Gambia, Brit. W. Africa; extensive trade; airport; pop. 20,000, 7-440.
Bath White, butterfly. 2-139 illus.
Bathyscaphe. Free diving chamber for deep-sea exploration; ascent and descent controlled by contraction and expansion of light petrol. Invented by Piccard, 1952.
Bathysphere. Metal sphere for deep sea diving, 5-496.
Batik. Javanese method of printing textiles, 3-141.
Batley Tn. In W. Riding of Yorks, Eng.; centre of heavy woollen trade; iron foundries; coal and ironstone mines; pop. 40,192.
Baton laaf. 2-52.
Baton Rouge. Cap. of Louisiana, U.S.A.; pop. 125,629; petroleum

BATTERSEA

refinery; heavy shipping trade in sugar, cotton and lumber, 5-13.
Battalion. In Brit. army an infantry battalion consists of five companies, nominal strength 850, commanded by a lieutenant-col. Three battalions usually form an infantry brigade.
Batten, Jean (b. 1909). N.Z. aviator; in Oct. 1937 flew solo from Australia to Eng. in 5 day, 18½ hrs.
Bat'tenberg. Family name of medieval Ger. counts; revived 1851; Princess Victoria Eugenie, daughter of Prince Henry of Battenberg, married Alfonso XIII of Spain (1906); Eng. branch the Mountbattens.
Battens, In lumbering, 5-49.
Batter. See **Architecture** (table).
Battersea. Met. bor. of s.w. London; pop. 117,130; park, 185 acres;

SOME OF THE WORLD'S MOST IMPORTANT BATTLES

Actium (31 B.C.): Naval battle fought off coast of Greece between forces of Antony and Cleopatra, and those of Octavian. Antony's defeat left Octavian master of the Roman world.
Agincourt (1415): Exhausted Eng. force (mostly archers) under Henry V defeat Fr. army many times their strength.
Alamein (1942): Decisive defeat of Italo-Germans in N. Africa by British 8th Army.
Arbela (331 B.C.): Alexander the Great finally defeated Darius III of Persia, and became master of Asia.
Armada, Spanish (1588): Flotilla of nimble Eng. ships defeated great Sp. war fleet in Eng. Channel.
Austerlitz (1805): "Battle of Three Emperors"; Napoleon defeated united forces of Russia and Austria.
Bannockburn (1314): Victory of Scots under Robert Bruce over English army led by Edward II. Scotland gained freedom from English aggression for nearly 20 years.
Blenheim (1704): Eng. and Austrians under Marlborough and Eugene defeated Fr. and Bavarians under Tallard in War of Sp. Succession; dissipated Louis XIV's ambitions.
Borodino (1812): Costly Fr. victory over Russians opened road to Moscow.
Boynes (1690): Fought near Drogheda, Ireland, victory for William III of England, over forces of the exiled James II putting an end to the latter's hopes of restoration to the throne.
Britain (1940): First great air battle in history. R.A.F. defeated attempts by German air force to put out of action the airfields of s.e. England and thus pave way for invasion of Britain. The "Battle of Britain" lasted four months.
Cannae (216 B.C.): Hannibal of Carthage annihilated great Roman army. Rome's existence threatened.
Chaeironae (338 B.C.): Philip of Macedonia gained mastery of all Greece.
Châlons (451): Traditional site at which Visigoths checked Attila's advance, saving W. Europe from the Huns.
Coral Sea (1942): Allied naval force defeated a Japanese fleet, saving Australia from invasion.
Creedy (1346): Edward III and Eng. longbowmen won victory over a vastly superior Fr. army of cavalry.
Culloden (1746): Jacobite army under Charles Edward Stuart almost totally destroyed by English royalist troops commanded by the Duke of Cumberland; ended second Jacobite rising, and was last engagement fought on the soil of Great Britain.
Gettysburg (1863): One of decisive battles of Amer. Civil War; Union troops under Meade sharply defeated Lee, forcing his retreat from Northern soil.
Hastings (1066): William, Duke of Normandy, defeated Eng., their king, Harold, falling in battle; originated Norman rule over England.
Jutland (1916): Most important naval conflict of 1st World War, in North Sea; after heavy losses on both sides, Brit. fleet, under Jellicoe and Beatty, forced retreat of Ger. vessels.
Kohima (1944): A town in Assam garrisoned by British troops and besieged by Japanese. With its relief, the Japanese invasion of India collapsed.
Leipzig (1813): Swedes and Saxons under Gustavus Adolphus won brilliant victory over Cath. Imperialists, and saved Prot. cause in Thirty Years' War.
Leipzig (1813): "Battle of the Nations": overwhelming defeat inflicted upon Napoleon by allied forces; marked end of Fr. rule in Ger.; turning-point in Napoleonic wars.
Lepanto (1571): Venetian and Sp. fleets under Don Juan of Austria decisively defeated Turkey in Gulf of Corinth, ending Turkish sea power.
Leyte Gulf (1944): With defeat of a Japanese fleet by U.S. fleet off Leyte, Philippine Is., Japanese sea-power was smashed.
Marathon (490 B.C.): Militaries, with a small force of Athenians and Plataeans, routed large Persian army, saving Greece from Asiatic conquest.
Marna, The. First battle (1914): Fr. and British forces under Joffre and French checked Ger. invasion in four-day battle and drove Ger. back to r. Alsne, where battle line remained nearly stationary for three years. Second battle

(1918): Counter-offensive launched by Foch with Fr. and Amer. troops; placed Germans finally on defensive.
Metaurus (207 B.C.): Romans under the consul Nero defeated Hasdrubal (who was slain) and his Carthaginians, thus preventing union of Hasdrubal and Hannibal, saving Italy.
Midway (1942): Defeat by a U.S. fleet of a Japanese force equipped for invasion of the Hawaiian Is. marked end of Japanese advance in the Pacific.
Nile (1798): Naval battle in Aboukir Bay, Egypt; Nelson destroyed Fr. fleet, cutting off Napoleon from Fr.
Orleans (1429): Joan of Arc raised Eng. siege; turning-point in Hundred Years' War.
Plassey (1757): Brit. under Clive defeated forces of Suraj-ud-Dowlah, nawab of Bengal; established Brit. rule in India.
Plevna (1877): After long siege, surrender of this pivotal point by Turks virtually concluded Russo-Turkish War.
Poitiers (1356): Victory of Black Prince over King John of Fr.; many prisoners taken, including John; ended first period of Hundred Years' War.
Poltava (1709): Peter the Great of Russia completely defeated Charles XII of Sweden, annihilating his army; Rus. succeeded Sweden as the leading power of the N. at conclusion of the Great Northern War.
Quebec (1759): Brit. under Wolfe stormed and took Quebec after gallant defence by Fr. general, Montcalm, securing Brit. domination of N. Amer.
Sadowa (1866): Crushing defeat administered to Austria by Germans under Moltke; led to exclusion of Austria from Ger. Confederation; also called Königgrätz.
Salamis (480 B.C.): Athenian fleet built by Themistocles almost annihilated Persian fleet; forced withdrawal of Xerxes from Greece.
Saratoga (1777): Surrender of Burgoyne and his Brit. army to Amer. general, Gates; turning-point in War of Amer. Independence.
Sea of Japan (1905): Japan destroyed Rus. navy and became a world power; also called Tsurushima.
Sedan (1870): Prussians under Moltke defeated MacMahon and forced surrender of Napoleon III and 100,000 men; caused fall of Fr. Empire and proclamation of Third Republic.
Somme (1916): Eng. and Fr. took offensive for five months, made small gain in territory at enormous cost, but relieved Verdun and aided Russians in east.
Stalingrad (1942-43): Russians prevented Germans crossing river Volga; turning-point in Russo-German battles of 2nd World War.
Syracuse (413 B.C.): Syracusans with Spartan aid destroyed Athenian fleet, dealing a death-blow to Athens' naval supremacy and contributing to her defeat in the Peloponnesian War.
Tannenberg (1914): Germans under Hindenburg stopped the Rus. invasion of E. Prussia.
Tautoburger Wald (A.D. 9): Germans under Arminius (Hermann) annihilated Roman army commanded by Varus; established Rhine and Danube as northern Roman frontier.
Thermopylae (480 B.C.): Heroic effort of Leonidas and a small body of Spartans to check Persian hordes of Xerxes in their march on Athens; Athens destroyed.
Tours (732): Charles Martel and the Franks forced the retreat of the Arabs, saving W. Europe from Muslim invasion.
Trafalgar (1805): Nelson destroyed the combined Fr. and Sp. fleets, firmly securing England's sea power, the chief menace to Fr. conquests.
Verdun (1916): French under Pétain retained fort in spite of supreme effort by Germans, thus keeping barred the road to Paris and increasing the confidence of the Allied forces.
Violsburg (1863): Grant cut Confederacy in two by its capture; capitulation, with Gettysburg, decided Am. Civil War.
Waterloo (1815): Brit., Prussians, and allies under Wellington and Blücher effected final overthrow of Napoleon.
Yorktown (1781): Americans and Fr. under Washington forced surrender of Lord Cornwallis with 7,000 men, practically ending War of Amer. Independence.
Ypres, First Battle of (1914): Brit. prevented Germans from reaching Calais and occupying Channel ports.

BATTERY

5-27, 28: power station and district heating, 3-217, 4-150 with illus.

Battery. In artillery, unit of four or more guns, 1-261.

Battery. Two or more primary or secondary cells electrically connected and used as a single unit. Also, two or more capacitors or other pieces of apparatus electrically connected in one circuit, 1-386; voltage, 3-210.

Battery Park, New York, 5-419 illus.

Battery system, of poultry breeding 6-279, 278 illus.

Battle. Village in Sussex, Eng.; site of battle of Hastings, 4-136.

Battle Abbey, Sussex, Eng., 1-2 illus.

Battle-cruiser. Heavy type of warship which has virtually disappeared from the navy, 5-342, 343.

Battledore and shuttlecock. Children's game from which badminton developed, 1-346.

Battle dress. Active service uniform of British Army from 1939.

Battle Harbour, Cap of Labrador, Canada, 4-427.

Battlement. In architecture, wall or rampart built round the top of a fortified building.

"Battle of Nations" (1813). Napoleon Bonaparte defeated by Prussia, Austria, and Russia, fought at Leipzig, 4-177.

Battleship. Most powerful and heavily armoured type of warship; in modern navy, 5-342, 343; H.M.S. *Duke of York*, 5-345 illus.; H.M.S. *Vanguard*, 5-344 illus.

Batocot, Mt. Highest point in Kincardineshire, Scot. (2,555 ft.), 4-104.

Batu Islands. Small group in Indonesia off w. Sumatra, 445-54 m.; inhabited by Malays; birds, produce.

Batum, Georgia, cap. of Abkhazian A.S.R. Chief port on Black Sea; pop. 70,800; terminus of rly. and of petroleum pipe line from Baku; 6-177.

Baudelaire, Charles Pierre (1821-67) Fr. symbolist poet. In 1857 pub. *Les Fleurs du Mal*, marked by exquisite feeling for phrase and form, and by a perverse interest in the morbid. Greatly influenced Fr. and Eng. poetry of later 19th cent.

Baudot Multiplex. Instrument used in telegraphy to convert electrical impulses into plain printed language 7-238-239.

Baudouin (b. 1930). King of the Belgians from 1951, on abdication of his father, Leopold III, 1-419, 4-345.

Bauhaus. Dessau. Ger. school of architectural design founded by Walter Gropius (1919), 1-218.

Bautzen (howtzen). Tn. of Saxony, with textile and machinery mfrs.; pop. 40,000; here Napoleon won a success over the Prussians and Russians in 1813.

Baux [bo]. A vil. in s. of Fr., near Ailes; gives name to bauxite ore.

Bauxite. Hydrated oxide of aluminium, an ore from which aluminium is obtained, 1-128, 2-406.

Bavaria. Land of W. Germany; area 27,112 sq. m.; pop. 9,181,460; cap. Munich, 1-387, 4-3; earliest printed books, 2-4; Bavarians and Austrians compared, 1-324.

Bawden, Edward (b. 1903). Eng. artist 3-264.

Bax, Sir Arnold Edward Trevor (1883-1953). Eng. composer. Chief compositions, six symphonies; "The Garden of Fand"; "Tintagel"; "London Pageantry." Master of King's Music, 1942-53; 5-306.

Bax, Clifford (b. 1886). Eng. dramatist. Brother of Sir Arnold Bax (above). Plays include: *Midsummer Madness*; *The Rose Without a Thorn*; *Mr. Pepsy*; *The House of Borgia*.

Baxter, Richard (1615-91). Eng. Puritan preacher and scholar (*The Saint's Everlasting Rest*).

Bay or sweet laurel. Variety of laurel used as flavouring in cooking. From it was made the victor's crown of the Greeks and Romans, 4-456.

Bay. In physiography formation of 6-187.

Bay See *Architecture* (table).

Bayard, Pierre du Terrail, Chevalier de (1476-1524). Fr. military commander of time of Charles VIII and Francis I; pattern of chivalry.

Bayazid I (1347-1403). First Ottoman sultan, victor over allied Christian armies at Nicopolis (1396); defeated by Mongols, 7-334.

Bayberry, or Wax Myrtle. A shrub the wax is used in candles.

Bayern (b'yern). Ger. Land (Bavaria).

Bayeux. Tn. Normandy, France; pop. 10,216; famous for old cath., and Bayeux tapestry, 1-389; tapestry, 1-389 with illus., 5-419, 3-238, 7-226.

Baylis, Lillian (1874-1937). English theatrical manager of Old Vic and Sadler's Wells.

Bay of Islands. Co. and harbour of New Zealand, on s.e. coast of North Island. Numerous small isls. offshore.

Bayonet. Short-stabbing weapon, fixed to the rifle-barrel for hand-to-hand fighting. First used by Fr. in 1611. Takes name from Bayonne, Fr., where it was first made.

Bayonne, Fr. Historic tn. and fortress 4 m. from Bay of Biscay; pop. 31,700; mfg. and export trade.

Bayonne Bridge. Kull van Kull, New York, U.S.A.; span 1,850 ft., 2-66.

Bay Psalm-Book. The (1640), the first book in English printed in America, 7-363.

Bayreuth (b'yroth). City in Bavaria, pop. 35,000; home of the composer Wagner; noted for the Wagnerian musical festivals, 1-388, 7-109.

Bay rum. A toilet preparation made by mixing oil of bay with diluted alcohol and adding oil of allspice and oil of orange peel.

Bazaar. Oriental market place, in Afghanistan, 1-47 illus.; in Peking 6-109 illus.

Bazaine (baz-an'). **François Achille** (1811-88). Fr. marshal; commander-in-chief of the main Fr. armies in Franco-Prussian War.

Bazooka. Portable antitank rocket thrower, first used in 1942 by the U.S. army; operated by two men.

B.C. (Before Christ), in calendar reckoning, 2-174.

BCG serum, in treatment of tuberculosis, 5-53.

Beachcombers, in Pacific isls., 6-31.

Beachy Head. Chalk cliff (532 ft.) in Sussex, 3 m. from Eastbourne; famous lighthouse near by, 3-247, 4-505 illus. f.; Dutch and Eng. fleet defeated (1690) by Fr.

Beacons, as signals, 7-51.

Beaconsfield, Earl of. See *Disraeli, Benjamin*.

Beagle. Hound used in hunting, 4-209, 3-102, 101 illus. f.

Beaker folk, in prehistoric Britain, 2-73.

Beale, Dorothea (1831-1906). Brit. educationist; with Frances Mary Buss, a pioneer of higher education for girls; principal of Ladies' College, Cheltenham; estab. first residential training college for women, St. Hilda's, Cheltenham, 1885, and St. Hilda's Hall, Oxford, 1893, 2-315.

Beam. In engineering, 2-61 with diag.; rolled steel joist, 2-62 with diag.

Beam. See *Architectural Terms* (table).

Beam. See *Nautical Terms* (table).

Beam aerial, for long distance radio transmission, 6-345 illus.

Beam bridge, 2-61.

Beam engine. Form of steam engine, 7-153 with illus.

Beaming. Process in cotton mfr. 2-159 illus.

Beam Radio lighthouse, invented by Marconi, 5-123.

Beam transmission of radio; Marconi and, 5-123.

Bean. Fruit of various leguminous plants, 1-390; protein in, 6-297.

Bean goose, 4-47.

Bear. Animal of the genus *Ursus* 1-390; foot, 3-413 illus.

Bear. See *Stoek Exchange Terms*.

Bearded Tit; rare Brit. bird, *Panurus barinicus*; close relation of the commoner tits (blue, great, cole etc.), but of family *Panuridae*.

BEAULIEU

Beardmore glacier, Antarctica, 1-163.

Beard Moss. Branching threadlike grey-green lichen. Hangs from old forest trees in many parts of the world incl. Gt. Brit. Produces an orange dye.

Beards, 1-397.

Beardsley, Aubrey (1872-98). Famous Eng. black and white artist; work noted for its beauty of outline.

Bearing. See *Nautical Terms* (table).

Bearings. In engineering, 1-399; reducers of friction, 3-470; bearing bronzes, 1-116.

Beas. Riv., tributary of the Indus; one of the five rivers of the Punjab, India, 300 m. long, 4-259, 6-310.

Beat. When two musical notes are sounded which have a small difference in frequency, they mutually interfere and react to produce a third note of intermediate frequency equal to the difference between the two primary frequencies. This note is called a *beat*, and its frequency is the *beat frequency*. A similar phenomenon is made use of in the superheterodyne radio receiver; in coming signals are made to beat with an oscillation of another frequency set up by an oscillator in the receiving set. The beats are rectified and translated into pulses which operate the loud-speaker.

Beaton, Cecil (b. 1904). Brit. photographer and designer of theatrical costumes and decor.

Beaton, David (1491-1546). Chancellor of Scot. and archbishop of St. Andrews; unscrupulous, arrogant, and cruel statesman; persecution of heretics, 4-423.

Beatrice. In the *Divina Commedia*, the "glorious lady" of Dante's mystic adoration, and his guide through Paradise; identified with a certain Beatrice Portinari (1266-90) whom he saw when they were both children, and but seldom thereafter, 3-16.

Beatty, David Beatty, 1st Earl (1871-1936). Brit. sailor; commander of battle-cruiser squadron (1912-16), fought Dogger Bank battle (1915) and opened Jutland battle (1916); later succeeded Jellicoe as cmdr of Grand Fleet; a fine tactician and fighting sailor, 4-390.

Beauchamp. Eng. surname pronounced be'ham.

Beaulieu. Nickname of Henry I, King of Eng., 4-161.

Beaufort (b'fort). Countess of Richmond, Margaret (1411-1509). Founded Cambridge colleges, 2-182.

Beaufort Scale, for measuring the strength or velocity of the wind at sea in nautical miles per hour, the various strengths being given numbers. Formulated in 1805 by Admiral Sir Francis Beaufort and since periodically revised.

Beaufort Numbers	Wind.	Velocity in nautical m.p.h.
0	Calm	0
1	Light air	1-3
2	Light breeze	4-6
3	Gentle	7-10
4	Moderate	11-16
5	Fresh	17-21
6	Strong	22-27
7	Moderate gale	28-33
8	Fresh	34-40
9	Strong	41-47
10	Whole	48-55
11	Storm	56-63
12	Hurricane	64-71

Beauharnais (b'ahr-nä). Name of well-known Fr. family; Alexandre, Vicomte de, (1760-94), married Josephine (later empress).

Beauharnais, Eugène (1781-1824). Son of Empress Josephine, 6-322, 4-384.

Beauharnais, Hortense (1783-1837). Daughter of the Empress Josephine, and wife of Louis Bonaparte; marriage, 4-384, 1-517; mother of Napoleon III, 5-323.

Beauharnais, Josephine. See *Josephine*.

Beaulieu (bewley). Village in Hants, Eng.; pop. 1,200; has ruins of a Cistercian abbey begun 1204.

BEAULY FIRTH

Beauly [bō'li] Firth. Inlet of Inverness-shire, Scot., the upper basin of the Moray Firth, 7 m. long and 2 m. broad.

Beaumarchais [bō'mahrshā], Pierre Augustin Caron de (1732-89). Fr. politician, dramatist, and satirist; chief works, *The Barber of Seville*, *The Marriage of Figaro*.

Beaumaris. Co. town of Anglesey, N. Wales; pop. 2,128, 1-151.

Beaumaris Castle, Isle of Anglesey, Wales, 2-256 illus.

Beaumont, Francis (1584-1616). Eng. dramatist whose association with John Fletcher formed a "perfect union in genius and friendship"; *Philaster*, *The Maid's Tragedy*, *The Knight of the Burning Peatle*, 2-119.

Beauty culture, as a career, 2-234.

Beauvais [bō'vā]. Fr., cap. of Oise; pop. 17,550; Goldell tapestry, textile mfrs.; famous cathedral begun in 13th cent. R 101, 1-84.

Beaver. Furred animal, reddish-brown, largest of the rodents, 1-399, 4-55 illus.; fur, 3-196.

Beaverbrook, William Maxwell Aitken, 1st Baron (b. 1879). Newspaper proprietor and politician, 1 401.

Beccaria, Gaspar (1520-1570). Span. sculptor, 7 112.

Bêche-de-mer. See *Trepang*.

Bechuanaland Protectorate. Region of S. Africa under Brit. protection; home of the Bechuana, a Negro Bantu people, 1-51; area 275,000 sq. m.; pop. 296,383; 7 88, 89.

Beckenham. Mun. bor. of Kent; pop. 74,831; a residential suburb, 4 398.

Becket, Thomas (c. 1118-1170). Archbishop of Canterbury, 1 401; shrine at Canterbury, 2 213.

Beckford, Peter (1710-1811). Eng. sportsman and master of foxhounds; author of standard book on fox-hunting, 3-128.

Beckford, William (1760-1841). Eng. author and politician; eccentric personality; wrote Oriental romance, *Vathek*; spent lavishly on his estate at Fonthill, Wilts.

Becontree. Dist. of Essex, part of urban dist. of Dagenham, 11 m. E. of London. Vest. L.C.C. housing estate of over 40,000 houses. Pop. 111,000.

Bequerel, Antoine Henri (1852-1908). Fr. physicist; Nobel prize winner in 1903; discoverer of radio-activity (Bequerel rays), 6 351, 1-297.

Bed. An article of furniture, 1 402; mattresses, 3 490.

Bedaux, Charles Eugene (d. 1941). Amer. industrialist. Fr. by birth; introduced system to speed up work in factories; associated with Nazis in wartime; committed suicide under detention in U.S.A.

Beddgelert [bēd'gēlert]. Parish and vil. on borders of Caernarvonshire and Merionethshire, Wales, 7-78.

Bedeos, Thomas Lovell (1803-49). Brit. dramatic poet; has been called "a belated Elizabethan"; *The Bride's Tragedy*, *Duith's Just Book*.

Bede (c. 673-733). Eng. monk known as "The Venerable Bede," and "Father of English History" (his *Ecclesiastical History of the English Nation* chief source of information for period covered), 4-181; on Caedmon, 2-160; 1-142; 4-149.

Bedford, John, Duke of (1389-1435). Son of Henry IV of Eng. and brother of Henry V; regent of Fr.; in Shakespeare's *Henry VI* he is Prince John of Lancaster.

Bedford. Co. tn. of Bedfordshire on Great Ouse riv.; pop. 53,065, 1-404.

Bedford Blue butterfly, 2-139 illus.

Bedford College, Univ. of London. Founded 1849 for the higher education of women by Mrs. Elizabeth Jesser Reid; premises in Regent's Park, 5-33.

Bedford School. Public school founded in 16th cent., 1-404.

Bedfordshire. S. midland co. of Eng.; area 473 sq. m.; pop. 311,844; co. tn. Bedford, 1-404.

Bediivere, Sir. Cup bearer to King Arthur in medieval legend, and Excalibur, 6-458.

Bedlam. Bethlehem Royal Hospital, Eden Park, Beckenham; founded in London in 1217 as a priory; afterwards became lunatic asylum; site of, in Lambeth, now Imperial War Museum, 5 163.

Bedlington terrier. Dog, 3-100 illus. f. See also *Dogs* (table).

Bedloe's Island, New York; statue of Liberty, 5-413.

Beduin. Wandering Arabs of Arabian, Syrian, and N. African deserts, 1-192; on Asiatic steppes, 1-266; culture, 5-446; girl, 2-345 illus.

Bee. Insect of the order Hymenoptera; many thousands of species; native to all parts of the world where there are flowers, 1-405; sense of smell, sight, and hearing, 4-264; noising instinct, 4 189; pollination of flowers, 3 100; imported into Australia, 4-270.

Beebe, William (b. 1877). Amer. naturalist (*Our Search for a Wilderness*; *Galapagos*); inventor of the bathysphere, 5-496.

Bee-bread, 1-405.

Beech. Deciduous tree, 1 409, 7 312 illus., 7-316-317 illus. f.; compared with hornbeam, 4-195.

Beecham, Sir Thomas (b. 1879). Eng. musical conductor and operatic impresario. With his father, Sir Joseph Beecham, introduced Russ. opera and the Diaghilev ballet to London in 1911. Founded London Philharmonic Orchestra in 1931.

Beecher, Henry Ward (1813-87). Amer. preacher, champion of abolition of slavery, woman suffrage, and other unpopular causes.

Beech marten. See *Stone marten*.

Beech mast, nuts of beech tree; as food for pigs, 1-409.

Beef. Meat; cuts of, 5-154 illus.; Argentine trade, 1-223; horse-radish sauce and digestion, 3-900.

Beefsteak, 1-410.

Beefsteak fungus. Edible bracket fungus, *Psidium hepatica*, growing as parasite mostly on oak trees; succulent, dark red, like a beef steak.

Bee Hawk. Small hawk moth with wings transparent except for brown margin. Often seen on rhododendron flowers; larva eats honeysuckle.

Bee-hive, cross-section, 1-405 illus.

Beelzebub [bēl'zēbub], or *Baalzebub*. In Old Testament heathen god (2 Kings, II, vi); in New Testament, prince of devils; in Milton's *Paradise Lost*, Satan's chief lieutenant.

Bee orchid, plant, 5 529.

Beer. Beverage made by boiling and fermenting barley, malt and hops, with water, 5 97, 1 96; brewing at Burton-on-Trent, 2-133.

Beerbohm, Sir Max (1872-1956). Eng. author and caricaturist (*Zuleika Dobson*, *The Happy Hypocrite*; *Seven Men*; *And Even Now*).

Beer-she'ba. Anc. vil. of Jerusalem; referred to in Bible as southern limit of Palestine: "Dan to Beer-sheba."

Beerstraaten, Abraham (17th cent.). Dutch painter; "Catwyck in Winter," 5-391 illus.

Beeswax. Remaninder of the comb when honey has been extracted, 1-406, 408 diag.

Beet. Biennial plant, 1-410.

Beethoven, Ludwig van (1770-1827). Ger. composer and musician, 1-411; 5 305; and development of orchestra, 5-527; music for piano, 5-195; and Brit. national anthem, 5-326.

Beetle. Two-winged insect, family *Coloptera*; some 250,000 species, 1-412; armour coverings, 4-266. "Beetle," a type of plastic, 6-220.

Beeton, Mrs. Isabella Mary (1836-65). Eng. housewife; compiled the famous *Beeton's Household Management*, 2-499.

Beetroot, type of beet; used in salad, 1-411.

Beet sugar, 7-184.

Beggar's Opera, The. Lyrical drama of thieves and highwaymen, written by John Gay in 1728. Revived, with much success, at the Lyric Theatre, Hammersmith, in 1920-23;

also revived in Cambridge and London, 1948, music being newly scored by Benjamin Britten.

Begon [begawn'], Michel (1632-1710). Fr. patron of botany; the begonia named after him, 1-416.

Begonia. Flowering plant, 1-416.

Béguinage [bē'ginahzh]. Cluster of cottages in which Béguines, a religious community, live.

Béguine. W. Indian dance; originated in Martinique. Introduced to Europe (in Paris) 1931.

Béguines. Communities of women founded about 1170 at Liège by Lambert le Bègue. Later spread to Ger. and Fr. Some establishments still exist, e.g. Ghent and Bruges. They do not take monastic vows and live in béguinage. Devote themselves to education of children and care of sick and aged.

Begum. Title bestowed in India and Pakistan upon ladies of rank.

Behaviourism. System of psychology which views animal and human behaviour objectively, and analyses action as response (conditioned or otherwise) to stimulus.

Behemoth, animal mentioned in the Book of Job, thought to be hippopotamus, 4-180.

Behind the Market. See *Stock Exchange Terms*.

Behn, Aphra (1640-89). Eng. dramatist and novelist; earliest known professional Eng. woman writer; her best novel, *Oroonoko*, 3 286.

Behrens, Peter (1868-1940). Ger. architect; creator of "modern style" buildings; teacher of L. Corbusier, 1-218, 4-473.

Behring, Vitus. See *Bering*.

Beira. Town and port of Mozambique; spt. outlet of Rhodesia and railway terminus; pop. 13,000. In 1918 the Brit. owned port was sold to Port. govt. for £3,500,000.

Beirut [bē'root']. Cap. of Lebanon; pop. 202,000; exports silk, tobacco cotton; many Christian mission and schools, 4-472.

Beit, Alfred (1853-1906). Brit. financier; in association with Rhodes had control of diamond mines; he and his brother, Sir Otto (1861-1930) were noted philanthropists.

Beit Lahm. See *Bethlehem* (Jordan).

Bekaa Valley, Lebanon, between the Lebanon and Anti-Lebanon mts, 4-472.

Bekonscot. Town in miniature at Beaconsfield, Bucks, Eng., 5-229 illus.

Bel. One of chief Babylonian gods, identified with the Phoenician Baal.

Belcher, Jern (1781-1811). Brit. poetist, a butcher by trade. After losing an eye at rockets in 1803, he was defeated by Gen. Pearce, 1805, and by Tom Cribb, 1807 and 1809. A blue scarf with white spots, favoured by him, came to be called a belcher.

Belém. Suburb of Lisbon, Portugal; the Convento do Jerononymos de Belém, a convent (now an orphanage) and church founded in 1499 in honour of Vasco da Gama, contains his tomb.

Belém or Pará. Port on riv. Pará in mouth of Amazon, Brazil; 53 m. from Atlantic; pop. 381,000, 2-45; rubber exports, 7-96.

Belfast. Cap. of N. Ireland; pop. 443,070; 1-416; shipyards, 5-111 illus.; St. Patrick's bell, 1-425.

Belfast Lough. Inlet of the Irish Sea between cos. Antrim and Down; provides harbourage for Belfast, 1-416.

Belfort [bē'fawr]. Fortified tn. of Fr., cap. of Belfort Territory (a 25 sq. m., pop. 99,500); important strategic position near Ger. and Swiss frontiers; pop. 37,380.

Belfort Gap. Pass between Vosges and Jura mts.; strategic importance, 4-387.

Belfry. In architecture, part of tower or steeple in which the bell hung; sometimes called bell-tower.

Belga. See *Money* (table).

Belgae. Gallic tribe in Low Countries defeated by Julius Caesar (59 B.C.); gave name to Belgium, 1-411.

BELGIAN CONGO

Belgian Congo. See Congo, Belgian.
Belgian hare, variety of rabbit, 6-327 illus., 328.

Belgium. Kingdom of W. Europe bordering North Sea, between Netherlands and Fr.; area 11,755 sq. m.; pop. 8,625,000; cap. Brussels, 1-417; map, 1-418; language problems, 1-419, 420; fisheries, 3-379; flag, 3-384 illus. f.; history, 1-417, 418, 7-484; 3-315; battle of Waterloo, 7-428-29 with illus.; Belgian Congo, 2-481, 482; Leopold II, 4-485; and World Wars, 3-317, 7-478, 487 with illus.

Belgrade. Cap. of Yugoslavia; pop. 389,114, 1-422, 7-518 and map.

Belial (bē'li-al). Biblical name of Satan; "sons of Belial," wicked men.

Bellarus (bēl'ar'us) (c. 505-565). Byzantine general to whom Rom. Empire under Justinian I largely owed its safety against Persians, Vandals, Goths, etc., 2-148, 4-306, 7-379. Late legend represents him, blinded by Justinian's jealousy, begging in Constantinople.

Bellisa Beacons. Signs erected at a pedestrian crossing (q. v.). Named after Leslie Hore-Bellisa, the minister of transport responsible for their introduction in 1934.

Belize. Cap. of Brit. Honduras; pop. 17,000, 4-190.

Bell, Alexander Graham (1847-1922). Scottish-Amer. scientist and inventor, 1-422; 4-57, 7-240.

Bell, Alexander Melville (1819-1905). Father of A. Graham Bell, teacher and elocutionist, 1-423.

Bell, Dr. Andrew (1753-1832). Co-founder with Joseph Lancaster and others of the National Society for establishing Free National Schools.

Bell, Sir Charles (1774-1812). Scottish anatomist, discoverer of distinction between motor, sensory, and sensorimotor nerves.

Bell, Currer, Ellis, and Acton. See Brontës, The.

Bell, Gertrude M. L. (1868-1926). Brit. traveller and archaeologist; journeys in Arabia, 1-195.

Bell, Henry (1767-1830). Scottish engineer, built steamship *Comet* (1812).

Bell, Dr. Joseph (1837-1911). Scot. surgeon; original of Sherlock Holmes, 3-112.

Belladonna. See Atropine.

Belladonna lily. Flower, native of S. Africa, 4-507.

Bellevue (bē'loo) **Wood.** Fr., near Chateau-Thierry, bought by U.S.A. in 1918 for a national park; battle in 1st World War, 7-482.

Belleck Ware; fine porcelain, biscuit ware, etc., also with a mother-of-pearl glaze; made at Belleek, co. Fermanagh, N. Ireland.

Belle Isle, Strait of. Channel between Labrador and Newfoundland, n. entrance to Gulf of St. Lawrence; open only in summer; 10 to 15 m. wide, 5-391.

Bellerophon. (Gk. legendary hero; slayer of the fire-breathing monster Chimæra, by the aid of Pegasus, the winged horse; and the Amazons, 1-130; and Pegasus, 6-106.

Bellerophon. Battleship on which Napoleon surrendered in 1815.

Bell-flower. Popular name for members of genus *Campanula*, family Campanulaceae, including Canterbury bells; harebell also in this genus.

Bellini, Gentile (c. 1429-1507). Son of Jacopo Bellini; Venetian painter, 4-318.

Bellini, Giovanni (c. 1430-1516). Venetian painter; son of Jacopo Bellini, 4-318; "Doge of Venice," 4-326 illus.

Bellini, Jacopo (c. 1400-70). Venetian painter, 4-318.

Bellini, Vincenzo (1801-35). It. operatic composer; *Norma*; 5-514.

Bell Mountain. See Djebel Nakus.

Belloe, Hilaire (1870-1953). Brit. historian, essayist, novelist, and poet, 1-423; and Chesterton 2-332.

Bellona (bēl'ō-nā). In Rom. myth., goddess of war, described as wife or sister of Mars.

Bellows, of organ, 6-3.

Bell Rock. Reef and lighthouse in North Sea off coast of Angus, Scot.

Bella and Bell-ringing. 1-424; composition of bell metal, 2-92.

Bell tower, or campanile; examples of, 1-425.

Belly. Name given to part of a hide; uses, 4-467 with diag.

Belmore Hill (1,312 ft.) in Fermanagh, N. Ireland, 3-346.

Belorussia. See White Russia.

Below par. See Stock Exchange Terms (table).

Bel'sen. Ger. concentration camp near Celle, Hanover; taken by Brit. 2nd Army April 1945; contained nearly 40,000 men, women and children; scene of appalling horrors.

Belshazzar. In the Book of Daniel, last king of Babylon, son of Nabonidus; killed when Babylon fell, 538 B.C.; warned of his doom by "writing on the wall" interpreted by Daniel, 1-330.

Belling leather, type of leather used for, 4-468.

Beluga. See White Whale.

Belvedere (bēl'ved'ēr). In architecture, open structure or pavilion built on the top of a house.

Belvoir (bē'vēr). Dist. of Leicestershire famous for fox-hunting.

Bembo, Pietro (1470-1547). It. literary dictator; and Ariosto, 4-329.

Benares (benah'rēz). Holy city of India on riv. Ganges; pop. 265,000, 1-427; pilgrims, 3-501, 8-202.

Ben Attow. Mt. (3,383 ft.) in Ross and Cromarty and Inverness-shire, Scot.

Benavente v. Martinez (bān'avēntē'k ē mah'rē'tēth), Jacinto (1866-1951). Sp. dramatist, 7-122.

Benbecula. Isl. of Outer Hebrides, Scot. Area 36 sq. m.; pop. 1,300; fishing, farming, cattle-breeding.

Benbow, John (1653-1702). Eng. admiral; during his 2nd command in W. Indies (1702) fought his greatest battle against Fr.

Benchley, Robert (1889-1915). American humorous writer, 7-366.

Benzendorff, Alexander, Count (1819-1917). Russ. diplomatist; as ambassador in London 1903-17 he encouraged friendly relations between Brit. and Russ.

Ben Cleugh. Peak of the Ochil Hills, Clackmannanshire, Scot. (2,363 ft.), 2-105.

Bend (portion of a hide) See Butt.

Ben'digo. Australia, 11th city in Victoria; pop. 30,779; large gold-field.

Benedict, Saint (c. 480-543). Founder of Benedictine order of monks, 1-428, 5-243, 1-3.

Benedict. Popes. For list see Pope.

Benedict XV (1854-1922). Pope, elected Pope in succession to Pius X, Sept. 3, 1914; observed strict neutrality in 1st World War, and made efforts to bring about peace.

Benedictine, a liqueur invented by Benedictine monks at Fécamp, Normandy, 1-428.

Benedictines. Order of monks living under the rule of St. Benedict. The rule is not harsh and learning has always been encouraged. Habit usually black, hence "black monks." Monte Cassino (Italy) is chief monastery; rule, 5-243, 1-428, 2-3.

Benefit of clergy, 1-402.

Benelux. Customs union between Belgium, Netherlands and Luxembourg, 1-420, 5-54.

Benek, Eduard (1884-1948). Czechoslovak statesman, 1-428.

Benevento (bān'avēnt'ō) (anc. Beneventum). It.; pop. 37,800; arch of Trajan (114); battle of (1266).

Beneventum, battle of (274 B.C.). Romans defeat Pyrrhus, 6-314, 6-430.

Benezet, Saint (12th cent.), and Avignon bridge, 1-320.

Bengal. Former prov. of British India (a. 77,442 sq. m.; pop. 60,306,000); later divided between India and Pakistan; 1-428, 4-239; jute warehouse, 4-389 illus.

Bengal, Bay of. Portion of Indian Ocean between India and Burma.

BENTHAM

Bengal'i. One of chief modern languages of Hindustan, derived from Sanskrit; literature of modern development known through works of Tagore, 1-128, 4-211.

Bengal Monkey. See Rhesus Monkey.

Bengemma Hills, Malta, 5-98.

Benghazi. One of the two capitals of Libya; pop. 62,300, 4-488; 7-489, 493.

Benguela. Spt. of Angola; pop. 4,000.

Ben-Gurion, David (b. 1886). Israeli politician; prominent in formation of Israeli state, in 1948; its first prime minister and min. of defence.

Beni-Hasan (bā'nī hasah'n). Village Upper Egypt; rock tombs and paintings (about 3000 B.C.).

Benin. Dist. in Nigeria; native art, 5-430.

Benin. Riv. of Nigeria. Jameson and Ethiope rivs. unite 50 m. from Gulf of Guinea to form Benue.

Benin, Bight of. Bay in Nigeria, part of Gulf of Guinea.

Benjamin. Youngest son of Jacob and Rachel, and ancestor of the tribe of Benjamin (Gen. xxxv, 18), 4-383.

Ben Lawers. Mt. in Perthshire, Scot. (4,001 ft.), 6-138.

Ben Ledi. Mt. in Perthshire, Scot.; near Chander, 2,875 ft. high.

Ben Lo'mond. Mt. (3,192 ft.) in s.w. of Strathmair, Scot.; on shore of Loch Lomond, 6-511.

Ben Lomond. Highest peak in Tasmania (5,160 ft.), 7-229.

Ben Lul. Mt. on Perthshire and Argyllshire borders, Scot.; 3,708 ft. high.

Ben Maodhui (makdō'hi). Mt. in Scot. on the borders of Aberdeenshire and Banffshire, 4,296 ft. high; second highest mt. in Gt. Brit., 1-361, 1-5.

Ben More. Mt. in s.w. Perthshire, Scot., 3,843 ft. high, 6-138.

Ben More Assynt. Mt. in Sutherlandshire, Scot., 3,273 ft.

Bennett, Air Vice-Marshal Donald C. D. (b. 1910). Australian airman; Commander of the Pathfinder Force of R.A.F. Bomber Command, 1944-45; pioneer in developing use of radar and "Fido."

Bennett, (Enoch) Arnold (1867-1931). Eng. novelist, playwright and essayist, 1-429, 5-173, 7-141, 3-291.

Bennett, James Gordon (1795-1872). Amer. journalist, b. Scot.; originated detailed reporting of events, practice of interviewing and use of telegraph in reporting; founded *New York Herald*, 1835. His son James Gordon Bennett (1841-1918) was ed. and proprietor of *New York Herald*; sent Stanley to Africa; founded balloon race.

Bennett, Richard Bedford, Vis. (1870-1917). Canadian politician; prime min. (1930-35); viscount, 1941.

Bennett, Sir William Sterndale (1816-75). Brit. musician; composer of symphonies, music for pianoforte, and choral works.

Ben Nevis. Highest mt. of Brit. Isles (4,106 ft.) in Inverness-shire, Scot., 1-430, 2-86; 4-275, 6-511.

Benson, Arthur Christopher (1862-1925). Eng. essayist and literary critic; eldest son of Archbishop Benson (*The Upton Letters*; *From a College Window*; *Beside Still Waters*).

Benson, Edward Frederic (1867-1940). Eng. novelist; brother of above; *Dodo*, published in 1893, brought him to the front as a novelist.

Benson, Edward White (1829-96). Eng. churchman, Archbishop of Canterbury, 1883-96.

Benson, Sir Francis (Frank) Robert (1858-1939). Eng. actor; founded the Benson Shakespearean repertory company, in 1884.

Benson, Robert Hugh (1871-1914). Rom. Cath. priest; brother of A. C. and E. F. Benson; wrote on religious subjects and several novels.

Benson, Stella (1892-1933). Brit. novelist; *Tobit Transplanted*, *Good-bye Stranger*.

Bentham, Jeremy (1748-1832). Eng. philosopher and jurist; 1-430, 6-160.

BENTIVOGLIO

Bentivoglio family. Bolognese rulers in Renaissance times, 1-510.

Bentley, Edmund Clerihew (1875-1956). Brit. journalist, novelist, etc., inventor of the form of verse known as the clerihew. Best-known book, *Trent's Last Case*.

Bentley, Richard (1662-1712). Famous Eng. classical scholar (*Dissertation on Epodes of Phalaris*).

Bentonite, a type of clay, 2 106.

Benue (ben'wē). River of W. Central Africa, over 800 m. tributary of Niger. Now gives its name to a prov. of N. Nigeria, formerly Nassarawa, 5-435.

Ben Vorlich. Scot. mt., Dumbarton, 3,092 ft., 3-135.

Ben Wyvis. Mt. in Ross and Cromarty, Scot., 3,862 ft., 6 155.

Benz, Carl (1844-1929). Ger. engineer; motor-powered tricycle, 6-413.

Benzaldehyde. The essential oil of almonds; used in many flavouring substances and perfumes, and the manufacture of benzole acid and dyes; prepared from toluol or benzol.

Benzene, known commercially as **benzole** or **benzol**. Product of the distillation of coal-tar; many drugs and dyes, including aniline dyes, may be made from it as a starting-point; often added to motor fuel; ring structure of, 2-319; model of organic molecule, 2-320 illus.; discovery by Faraday, 3-341; from coal-tar, 2-131, 3-507.

Benzine, or petroleum ether. A mixture obtained by the fractional distillation of petroleum; not to be confused with benzene; much used for cleaning purposes.

Benzoic acid. A bacteriostatic, used in tooth pastes, the seasoning of tobacco, manufacture of dyes and preservatives; from coal-tar, 2 134.

Benzoin. A balsam obtained from the tree *Styrax benzoin*, native to East Indies; as fixative in perfumes, 6-121.

Benzol(e). The commercial name for benzene. See **Benzene**.

Beowulf (bā'woolf). Old English epic poem, 1-431, 3-283.

Béranger (bā'ran zhā). Pierre Jean de (1740-1857). Fr. song-writer, poet of the people, and political satirist.

Berar. Part of the state of Madhya Pradesh, Republic of India; produces cotton and wheat.

Berbera. Cap. and chief spt. of British Somaliland on Gulf of Aden; pop. about 20,000, 7 81.

Berbers. Anc. white race of N. Africa; includes Kabyles and Tuaregs; gave name to Barbary states; 1 50; in Algeria, 1-110; in Morocco, 5 261.

Bercoose. See **Musical Terms** (table).

Berchtesgaden (bärkh'tesgaden). Village in S. Bavaria, and country resort of Hitler, here Hitler received Neville Chamberlain on his first visit to Germany, Sept. 1938; bombed and captured 1945.

Berehtold, Leopold, Count von (1863-1912). Austro-Hungarian statesman. Ambassador to Russia and foreign min. (1912-15); in 1913 favoured war with Serbia.

Bere barley, 1-369.

Beresford, Charles William, 1st Baron (1816-1919). Eng. admiral and author; second son of 4th Marquis of Waterford; in command of naval brigade in Nile expedition, 1881; made a peer in 1916.

Beret. Hat, 4-137.

Berg, Alban (1845-1935). Austrian composer; works include opera *Wozzeck*.

Bergamo (bär'gahmō), It. Picturesque tn. nr. Milan; pop. 105,000; notable old churches; silk and other textiles.

Bergamot oil. Obtained from the bergamot orange 5-521, 5-506.

Bergen, Norway, chief port on N.W. coast; pop. 130,000; exports fish and fish products, 5-462.

Bergner, Elisabeth (b. 1898). Austrian actress (*St. Joan*, *The Constant Nymph*, *Escape Me Never*, *Catherine the Great*, *Rosalind in As You Like It*).

Bergson (bär'g'son), Henri (1859-1941). Fr. philosopher who denied claim of science to explain universe on mechanical principles (*Time and Free Will*; *Matter and Memory*; *Creative Evolution*; *Laughter*; awarded Nobel prize for literature in 1927; 6-160).

Beri-beri, nervous disease resulting in paralysis, dropsy, and frequently death; and rice diet, 6 398, 7-403.

Bering (bär'ing) or **Behring**, Vitus (1680-1741). Danish navigator, commissioned by Peter the Great to explore N.E. Asiatic coasts for Russia; discoverer of Bering Strait and Alaska, 1-90, 1-431.

Bering Sea. Part of N. Pacific Ocean bordered by Alaska, the Aleutian Isles, Kamchatka and Siberia, 1 131, 6-26.

Bering Strait, channel separating Asia and N. Amer. and connecting N. Pacific with Arctic Ocean, 1-88.

Berkeley, George (1685-1753). Ir. idealistic philosopher; maintained that matter has no existence independent of mind; political economist, writer and Anglican bishop, 6 160 with portrait, 3 288.

Berkelium (bik). (Chem. element, atomic no. 97, atomic weight 213 3-221.

Berkhamsted. Tn. in Herts, Eng.; infra. straw plaiting, chemicals and woodware; has well-known school (founded 1541). Pop. 10,777.

Berkshire. Eng. co.; area 725 sq. m.; pop. 288,763; co. in Reading 1-431; downs, 3-111.

Berlichingen (bär'lichingen), Götz von (1480-1562). "Götz with the iron hand"; Ger. feudal knight and soldier of fortune; subject of drama by Goethe.

Berlin. Former cap. of all Germany, 1-432; 4-1, 4; air-lift (1948-49), 4-11; Freedom bell, 1-125 illus.; fire brigade, 3 363 in 2nd World War, 7-189, 196.

Berlin, Treaty of (1878). Bosnia and Herzegovina, 2-20; Bismarck and Balkan crisis, 4-175.

Berlin, Irving (b. 1888). Amer. musician composer of popular songs, including "Alexander's Ragtime Band," also of songs in several stage and screen "musicals," e.g. *Annie Get Your Gun*, *Top Hat*, *Call Me Madam*.

Berlin-Baghdad Railway, 1-346.

Berlin Decrees. Issued by Napoleon, Nov. 1806, beginning of *Continental System*.

Berline. Four-wheeled horse-drawn covered carriage with suspended body. Used in Fr. in 18th cent.

Berliner, Emile (1851-1929). Amer. inventor of the gramophone, 4-57; helicopter design, 4 158.

Berlin Pact, or Tripartite Pact. Military, political and economic agreement, in 1940, between Germany, Italy and Japan. See **Axis**.

Berlioz (bär'lōz), Hector (1803-69). Fr. musical composer, brilliant romanticist, father of modern orchestration (*Damian of Faust*, *Symphoni Fantastique*).

Bermundsey. Met. bor. of London S. of the Thames; pop. 60,661. Has leather, chemical, and engineering works and the Surrey Commercial Docks, 5-27.

Bermuda Lily, parts in detail, 3-399, 400 illus.

Bermudas. Group of coral-reef isls. in Atlantic forming a Brit. colony. Total area about 22 sq. m.; pop. 37,000, 1-434.

Bermudez (bermō'd'hāz), Juan (b. 1495). Span. sailor; discovered Bermudas 1-435.

Bermudez. State in N. Venezuela, between Orinoco r. and Caribbean Sea; asphalt lake, 1-275.

Bernadette (bär'nadēt) (1841-79). Fr. saint, at the age of 14 had visions of the Virgin Mary at the grotto of Massabielle there a spring began to flow, now the waters of Lourdes, canonised 1933.

Bernadotte (bär'nadōt), Folke, Count (1895-1948). Swedish humanitarian, nephew of King Gustavus V.,

BERWICK-UPON-TWEED

intermediary in Ger. offer of un-conditional surrender to Gt. Brit. and U.S.A., April 1945; also between Arabs and Jews 1947-48; assassinated in Jerusalem by Jewish terrorists, Sept. 17, 1948, 4-363.

Bernadotte, Jean Baptiste Jules (1764-1844). Fr. general, elected crown prince of Sweden. Ruled as King Charles XIV (1818-44).

Bernal John Desmond (b. 1901). Brit. scientist; eminent crystallographer; important in Operational Research, Second World War, wrote *The Social Functions of Science*.

Bernard, St., or Clairvaux (1090-1153). Fr. monk, one of most illustrious and eloquent preachers of Middle Ages, opposes Abelard, 1-4; and Second Crusade, 3-2.

Bernard (bär'nahr), Claude (1813-78). Fr. physiologist, discoverer of digestive work of pancreatic juice, sugar-forming work of liver, and existence of vaso motor and vaso-constrictor nerves.

Berne. Canton of Switz. Area 2,655 sq. m.; pop. 798,261, 1-436.

Berne. Cap. of Switz.; pop. 145,710 1-435, 7-211.

Berners, Dame Juliana. Perhaps first Eng. woman writer; wrote *Book of St. Albans* (1386), and *Treatise of Fishing with an Angle* (1496 3 382).

Bernese Oberland. Alpine group in Switz., containing the Eiger, Mönch, and Jungfrau peaks, 1 436.

Bernhard, Prince of the Netherlands (b. 1911). Prince of Lippe-Biesterfeld, consort of Queen Juliana of the Netherlands; in 1941 was liaison officer between Netherlands and Brit. forces (army, navy, and air force).

Bernhardi (barnhār'dē), Friedrich von (1819-1930). Ger. general and author (*Germany and the Next War*, *World Power or Downfall*).

Bernhardt, Sarah (1841-1923). Famous Fr. actress, 1-436; and *The Lady of The Camellias*, 3-134.

Bernina Alps. Mt. range bordering Switzerland and Italy, (13,290 ft.).

Bernini (bär'nēnē), Giovanni Lorenzo (1598-1680). It. architect, sculptor and painter; designed the colonnade of St. Peter's and a palace for Urban VIII; director of public works at Rome; Apollo and Daphne, 1 183 illus., Pluto and Persephone 6 228 illus.

Bernoulli (bärnwēvē), Daniel (1700-82). Swiss mathematician, member of a family of which nine others were well known scientists; prof. of maths. at St. Petersburg, of anatomy and physics at Groningen, of anatomy, physics, and botany at Basle.

Berruguete, Alonso (d. 1561). Span. sculptor, 7-112.

Bersaglieri. Regiments of It. light infantry first raised 1836. Uniform dark green; hats have drooping plumes of black-cock's feathers. Reduced in numbers in 1947.

Bertha (d. c. 615). Queen of Ethelbert King of Kent; and St. Augustine 1-308.

Berthelot (bär'thōl), Pierre Eugène Marcellin (1827-1907). Fr. chemist founded synthetic chemistry and thermochemistry; proved organic compounds may be produced out of side of living bodies.

Berthollet (bär'thōl'ēt), Claude Louis Count (1748-1822). Fr. chemist; first physical chemist; with Lavoisier contributed to modern chemical nomenclature.

Bertillon (bär'teyavn), Alphonse (1853-1914). Fr. anthropologist introduced system of measurement for identifying criminals, 3-353.

Bervie. Tn. Kincardineshire, Scot. pop. 885. woollens, yarns and chemicals made, 4-404.

Berwickshire. Scot. co., pop. 25,060. Co. tn. is Duns, pop. 2,028; area 467 sq. m., 1-437.

Berwick-upon-Tweed. Tn. and city of Northumberland. Eng.; pop.

BERWYN MOUNTAINS

12,550, 1-436; Suspension bridge, 2-67; border warfare, 5-461.

Berwyn Mountains. Range of N. Wales, between Merionethshire and Montgomeryshire; Moel Sych (2,713 ft.), 5-175.

Beryl, a not uncommon mineral; source of beryllium; colour varies from blue to light green and yellow, 7-161.

Beryllium (Be), hard white metallic element of the alkaline earth metal group; at. no. 4; at. weight 9.02; melts at 1,280°C.; obtained from and named after beryl; 3-221; in atomic chain reaction, 1-301; hydroxide, 1-122.

Berzelius, Jöns Jakob, Baron (1779-1848), Swedish chemist, discovered selenium, thorium, and other elements; inventor of chemical symbols, 2-317.

Besançon [bezahn'sawn]. Fr. fortified city on R. Doubs; pop. 65,000; watches and clocks; notable Roman remains.

Besant [bezant'], Annie (1847-1933), Eng. theosophist; prominent in socialist and Indian nationalist movements, 4-251.

Besant, Sir Walter (1836-1901), Eng. novelist, mostly in collaboration with James Rice (*All Sorts and Conditions of Men*).

Besaque. In armour, 1-214.

Besnier, Henri (1647-1726), Fr. mechanician. Locksmith to Louis XIV of Fr. Invented flying machine, 1680, 1-27, 28 illus.

Bessarabia. Territory of s.w. Russia, formerly in Rumania; partly in Moldavia S.S.R., and semi-incl. in Ukraine S.S.R.; 13,417 sq. m.; pop. 2,865,500; incorporated in Soviet Union, Aug. 1940.

Bessel, Friedrich Wilhelm (1784-1846), Ger. astronomer and mathematician, 7-147.

Bessemer, Sir Henry (1813-98), Eng. inventor of Bessemer process of making steel, 1-437; 4-291, 7-23; model Bessemer converter, 1-437, 138 diag.

Beta, β , B (Rom. b, B). Second letter of Gk. alphabet; in astronomy usually denotes the second brightest star in a constellation.

Beta brass. Strong type of brass, used for heavy castings, 2-11.

Beta Centauri. Star of the first magnitude, 7-146.

Beta-rays, and radio-activity, 1-297, 6-351, 6-339.

Betatron. Apparatus for accelerating electrons to high energies in atomic research.

Betal [b'etl], nut of E. Indian palm; a preparation of the nuts is chewed by the natives, 5-187 with illus.

Betalgeuse. Star of the first magnitude, 7-146; diameter, 7-118.

Beth'any. Village near Jerusalem often mentioned in Gospels; home of Mary, Martha and Lazarus; modern village El-Azariyeh.

Bethel, Palestine. Village ("House of God") 10 m. N. of Jerusalem (Gen. xli, 8; xxxviii).

Bethesda. Pool in anc. Jerusalem with miraculous healing qualities.

Bethlehem. Tn. in Kingdom of Jordan, scene of many biblical stories and birthplace of Christ. Pop. 9,000, 1-439, 6-48.

Bethlehem. Tn. in Orange Free State, S. Africa. Pop. 13,232, 1-439.

Bethlehem, Pennsylvania, U.S.A. City on r. Lehigh; noted for large iron and steel works; pop. 66,340; 1-439.

Bethlehem, Star of (plant). See *Star of Bethlehem*.

Bethmann-Hollweg (bätmah'n holl'-vähk), Theobald von (1856-1921), Ger. statesman, imperial chancellor (1909-17).

Bethnal Green. Met. and parl. bor. of E. London; pop. 58,374; has branch of Victoria and Albert Museum; 5-27.

Betrothal customs. 5-134.

Betsileo. Tribe in Madagascar, 5-65.

Betsimisaraka. Native tribe in Madagascar, 5-65.

Betta splendans. Species of tropical aquarium fish, 1-188, 189 illus. f.

Betterton, Thomas (c. 1635-1710), Eng. actor-manager; appeared with Mrs. Bracegirdle. First to introduce movable scenery to Eng. stage, replacing tapestry backgrounds.

Betti, Bernardino di. See *Pinturicchio*.

Bettws-y-Coed. Small tn. in Caernarvonshire, Wales, a tourist centre, 7-78.

Betty, William (1791-1874), Eng. actor, known as "Young Roscius"; famous as boy actor (in *Hamlet*, etc.) from 1803 to 1808, 4-123.

Betulaceae [betülä'sië], the birch family, including birches, hazels, and alders.

Beurré d'Amanlis. Variety of pear, 6-100.

Beurré Die. Variety of pear, 6-100.

Beurré Superfin. Variety of pear, 6-100.

Beuthen [boi'ten], Poland. Mining and industrial tn. in Silesia; pop. 86,881; incorp. from Germany, 1945.

Bevan, Aneurin (b. 1897), Brit. Labour politician; min. of Health (1915-51); min. of labour and nat. service (1951).

Bevel. See *Architectural Terms* (table).

Beveridge, William Henry, 1st Baron (b. 1879), Brit. economist; director of London School of Economics, 1919-37; master of University Coll., Oxford, 1937-45; author of *Beveridge Report*, 1942, recommending unemployment insurance for all, free medical and hospital treatment, child benefits, marriage and death grants; many of its proposals became law as National Insurance Bill, in Jan. 1946.

Bevin, Ernest (1881-1951), Brit. Labour politician, 1-439, 5-157 illus.

Bewick, Thomas (1753-1828), Eng. wood engraver; illustrated many books (*British Birds*; *Jessie's Fables*), 3-294.

Bexhill. Seaside resort in Sussex, Eng.; pop. 25,668; De la Warr pavilion, 1-218.

Bexley. Borough of Kent, Eng., 4 m. W. of Dartford; pop. 88,767.

Bay. Hereditary title of native sovereign of Tunis; also title of nobility in Turkey until 1934; abolished in Egypt (1952), 3-182.

Boyer-Garratt. Type of articulated locomotive, 5-8.

Boyle, Marie Henri. See *Stendhal*.

Bezant. Byzantine gold coin in use 4th-15th cents. in E. Rom. empire and Europe.

Beziers [bä'zyä], Cath. tn. and trade centre in S. France; pop. 61,560; massacre of Albigenses in 1209.

Bhamo [bah'mö], Tn. and dist. of Upper Burma, 40 m. from Chinese border and 300 m. N.E. of Mandalay; head of navigation of Irrawaddy; centre for China-Burma trade.

Bhang. Indian name for dried leaves of the hemp plant, *Cannabis sat. va.*

Bharatpur [bahratpöör], State in the Union of Rajasthan, India; scene of famous British charge against the Jats (1826).

Bhils [bëlz], Savage dark-skinned race of cent. India, 4-241.

Bhopal. State of Rep. of India; area 6,921 sq. m.; pop. 38,107. Cap. Bhopal city, 4-211, 4-139.

Bhopal. City; cap. of Bhopal state, Rep. of India; pop. 15,091, 4-211.

Bhuj. Cap. of Cutch state, Rep. of India; pop. 21,579, 4-241.

Bhutan [bootahn'], State in E. Himalayas between Tibet and India; a. 18,000 sq. m.; pop. 300,000 agric., stock-raising.

Biafra, Bight of. Large bay of W. Africa. Contains Fernando Po, Prince's and St. Thomas Isls. Rives, Niger, Calabar, Cameroons, Sanaga and Gabon flow into it.

Biarritz [biä'ritz']. Fr. holiday resort on Bay of Biscay near Bayonne; pop. 22,955; summer residence of Napoleon III.

Bible, 1-440; Abraham, 1-5; Apostles, 1-184; Moses, 5-270; Noah and the Ark, 5-115; Samson, 6-495; Epistles

"BIG FIVE"

of St. Paul, 6-89; the prophets, 6-295; Wycliffe's Bible, 3-283 illus. 7-505 and illus.; Luther's translation, 5-53; Eng. translations, 4-164; Masarin Bible, 6-259 illus.; Tyndale's translation, 7-339; compared with Koran, 4-125; and medicine, 5-161; in Afrikaans, 1-66.

BOOKS OF THE BIBLE

OLD TESTAMENT

Genesis	Ecclesiastes
Exodus	Song of Solomon
Leviticus	Isaiah
Numbers	Jeremiah
Deuteronomy	Lamentations
Joshua	Ezekiel
Judges	Daniel
Ruth	Hosea
1 Samuel	Joel
2 Samuel	Amos
1 Kings	Obadiah
2 Kings	Jonah
1 Chronicles	Micah
2 Chronicles	Nahum
Ezra	Habakkuk
Nehemiah	Zephaniah
Haggai	Zachariah
Job	Malachi
Psalms	
Proverbs	

NEW TESTAMENT

Matthew	1 Timothy
Mark	2 Timothy
Luke	Titus
John	Philemon
Acts	Hebrews
Romans	James
1 Corinthians	1 Peter
2 Corinthians	2 Peter
Galatians	1 John
Ephesians	2 John
Philippians	3 John
Colossians	Jude
1 Thessalonians	Revelation
2 Thessalonians	

Bibliography, 1-444.

Biblioteca Nacional. Great library at Madrid, Spain, 4-187.

Biblioteca Nazionale Centrale. Great library at Florence, Italy, 4-187.

Bibliothèque Nationale. National library of Fr., 4-187.

Biceps. Muscle on front part of upper arm, 5-298.

Bicester [bis'ter]. Tn. in Oxfordshire, Eng.; pop. 1,171; agricultural and hunting centre, 6-22.

Bichat [bë'shah], Marie Francois Xavier (1771-1802). Fr. physiologist, founder of general anatomy.

Bicycle. 6-112; ball bearings, 1-309; brakes, 2-11; nos. used in Denmark, 3-71. See also *Cycles and Cycling*.

Bidauld [bë'dö], Georges (b. 1900), Fr. politician; premier June-Nov. 1946; 1949-50; for, min. 1947-48; 1953.

Bidean nam Bian. Highest mt. of Argyllshire, Scot.; 3,766 ft., 1-227.

Bideford [bid'diford]. Spt. and market tn. in Devon, Eng. Industries incl. engineering and boat-building; pop. 10,100.

Bieli, Andrei (1880-1934), Russ. poet and novelist, 6-480.

Biennial plants. 6-218.

Bifocal spectacles. 7-126.

Bigamy. In the U.K., the offence of going through a form of marriage with a person while a previous marriage to another still exists.

"Big Ben." The great bell in the clock tower at the Houses of Parliament; named after Sir Benjamin Hall, First Commissioner of Works, when it was hung in 1856, 5-23, 5-20 illus. f.; 5-25 illus. f.; 2-417 illus.; weight, 1-427.

Big Bone Cave. Tennessee, U.S.A., 2-282.

Big Dipper. Constellation. See *Ursa Major*.

"Big Five." In British banking, five large joint-stock companies—Barclays, Lloyds, Midland, National Provincial, and Westminster, 1-363.

BIGGLESWADE

Biggleswade. Tn. of Beds., Eng.; pop. 7,280; market-gardening, 1-404.
Bight, of rope, 4-421.
"Big Three." Name given to Lloyd George, Georges Clemenceau, and Woodrow Wilson at the Paris peace conference in 1919, 4-531.
Bihar. State of Repub. of India; area 69,438 sq. m.; pop. 40,218,900. Cap. Patna, pop. 175,706; 1-444, 4-211.
Bihari. Dialect of India, 4-241.
Bikaner [bōkahn'ner], Indla. Cap. of state of Bikaner, Rajasthan; pop. 127,226.
Bikini Atoll. Marshall Isls., Pacific Ocean; atomic explosions, 1-304 illus., 305; radio-active fall-out, 6-352.
Bilbao [bilbā'ō]. Chief spt. of N. Sp., on r. Nervion; pop. 229,334; exports iron ore from near-by mines; long famous for sword-blades (called "bilbos"); 7-103, 108 illus.
Bilberry. A deciduous shrub, family *Eriaceae*, 1-445.
Bile. Secretion produced by liver, 4-624; and digestion, 3-90, 4-27.
Bilge. See *Nautical Terms* (table).
Bilingualism. In S. Africa, 1-66.
Billiard balls. Ivory from African elephant, 4-331.
Billiards. 1-445; balls, 2-287.
Billingham-on-Tees. Tn. of Durham; pop. 23,000; chemical works, ship-building, engineering.
Billingsgate. London's famous fish market, near London Bridge on left bank of r. Thames; 5-21.
Billion. A million millions. (In France and America, a thousand millions.)
Bill of exchange. A written order from one person to another directing him to pay to a third person a sum of money which is to be charged to the account of the writer, 1-364, 3-418.
Bill of lading. A written acknowledgment of goods received for transportation issued by the master of a ship; acts as a contract to deliver the goods; when issued by a railway such a bill is called a way bill.
Bill of Rights (1689), 1-446; taxation, 6-88.
Bill of sale. A formal written statement of the sale of personal property; necessary when the transfer of the property does not occur at once.
Bills. In House of Commons, 6-90.
"Billicock." Nickname for bowler hat; origin of name, 4-137.
Bi-metallic. System in which two metals, usually gold and silver, are used as currency standards.
Bindweeds. Various plants of the genus *Convolvulus*.
Binet [bē'nā], Alfred (1857-1911). Fr. psychologist; devised intelligence tests, 4-271.
Bingen. Ger. tn. on Rhine; pop. 10,200; noted for Mouse Tower.
Binh-Dinh [bin'din]. Largest tn. in Annam, Indo-China; pop. 74,000.
Binnacle. Compass mounting, 2-174 illus., 475.
Binocular. Type of double terrestrial telescope, 7-250.
Binomial Theorem. in algebra, 1-107.
Binyon, Robert Laurence (1869-1913). British poet (*To the Fallen*); author of books on art.
Biochemistry. 1-446; as a career, 2-234.
Biography. Written account of a human life, 1-446.
Biology. Science and study of life, 1-447, 5-165; ecology as branch of, 3-158; evolution, 3-321; Mendelian laws of heredity, 5-169; parasites, 6-77; careers in biology, 2-234. See also Darwin; Embryology; Evolution; Heredity.
Bio-physics. Physics as applied to the life processes.
Biotope, or black mica, 5-190.
Biplane. Aeroplane with two supporting planes or wings, 1-41.
Birch. Deciduous tree common to temperate lands of the N. hemisphere, 1-452, 7-316 illus. f.
Birchborough Bridge. over Sabi r., Africa, 1-65 illus.
Bird. Cyril Kenneth. Brit. humorous artist. See *Fougasse*.

Bird-eating spiders, 7-135.

Birds, in golf, 4-46.

Bird-lice, 6-78.

Birds. Feathered vertebrate animals, 1-453; in Antarctica, 1-169; in Arctic regions, 1-222; cage birds, 2-207; eggs, 3-172, 1-452, 453 illus. f.; eye color, 3-332; feathers, 3-314; field of vision, 3-344 diag.; homing instinct, 4-189; migration of, 5-202, 5-204 illus. f.; protective coloration, 6-296; as seed carriers, 6-528; scientific classification of, 1-171; in sleep, 7-67; wing, anatomy of, 4-125 illus. See also names of the various birds.

Bird's eye (plant). See *under* Speedwell.
Bird's-foot trefoil. Brit. species of lotus used as cattle fodder, 5-40.

Bird's nest orchis. Plant; partnership with fungi, 6-144.

Bird's-nest soup, made of nests of an Oriental swift, 7-108.

Birds of prey. Term used loosely to include all vultures, eagles, hawks, falcons, and even owls. Strictly speaking, should be reserved for the eagles, hawks, and falcons of the order *Accipitriformes*.

Bird-Song, 1-471.

Birdwood, William Riddell Birdwood, 1st Baron (1865-1951). Brit. general; commanded Anzac forces in 1st World War and Brit. forces at Gallipoli evacuation; also 5th Army in Fr. (1918-19); C-in-C. India (1925-29); K.M. (1925); Master of Peterhouse, Cambridge (1931-38).

Bireme [bī'rem]. Anc. type of ship with two tiers of oars.

Biretta. Square cap worn by Rom. Cath. clergy; white for pope, red for cardinal, purple for bishop, black for others.

Birgitta, St. See *Bridget* of Sweden.

Bir Hachem (bōr hākēm). Outpost in Libya, 50 m. s.w. of Tobruk, held by Fighting Fr. under Gen. Koenig from May 26 to June 10, 1942, against odds.

Birkbeck, George (1776-1841). Eng. educationist; founder of Birkbeck Coll. (1823), now part of London University, 5-33.

Birkenhead, Frederick Edwin Smith, Baron (1872-1930). Brit. lawyer and politician; b. at Birkenhead; Unionist M.P., 1906; led Ulster M.P.s against Home Rule Bill; solicitor-gen., 1915; lord chancellor and baron, 1919; signed Irish treaty, 1921; viscount, 1921; earl, 1922; secy. for India, 1921-28; famous orator and robust personality.

Birkenhead. Spt. and shipbuilding centre on Mersey estuary, Cheshire, Eng.; pop. 143,392; 1-472, 4-525.

Birkenhead. Brit. troopship, 1-472.

Birkett, Sir William Norman (b. 1883). Barrister-at-law. K.C., 1924; Liberal M.P. Nottingham 1923-24; 1929-31; Justice of High Court, 1941; lord justice of appeal, 1950.

Birmingham, George A. (1865-1950). Pen-name of Canon James Owen Hannay, Irish clergyman and novelist (*General John Regan*; *Spanish Gold*).

Birmingham, Alabama, U.S.A. Chief city of the state; pop. 298,747; iron and steel manufactures, 1-87.

Birmingham. Industrial city of Warwickshire, Eng.; pop. 1,112,340; 1-473, 3-219 illus.; button manufacture, 2-146; steel pen industry, 6-112.

Birnam. Vill. in Perthshire, Scot., 15 m. n.w. of Perth; remains of a fortified camp near; Birnam Wood mentioned in *Macbeth*.

Birrell, Augustine (1850-1933). Eng. essayist and political leader; chief sec. for Ireland, 1907-16. Wrote *Obiter Dicta*; and critical biogs.

Birs Nimrud, and Tower of Babel, 1-336 illus.

Birth of a Nation, The (1914-15). Famous film directed by D. W. Griffith, 2-398.

Biscay, Bay of. Wide gulf of Atlantic Ocean between a coast of Brittany, Fr., and Cape Finisterre, Spain. The Loire, Garonne and Adour rvs. flow into it.

BLACK AND TANS

Biscaglia, Alfonso, Duke of (d. 1500). It. nobleman, second husband of Lucrezia Borgia; murdered, 2-18.

Biscuits, 2-52; factory, 2-53 illus.

Biscuit ware, in pottery, 6-276.

Bishop. Church dignitary, 2-264, 2-370, 386, 386; mitre, 4-137.

Bishop, chess piece, 2-330.

Bishop Rock. One of the Scilly Isles;

lighthouse, 4-502, 504 illus. f., 6-509.

Bishops' Bible. Revision of the Great Bible, issued in 1568, 1-415.

Bishops' Wars (1639-40). Scot. rebellion against Charles I. resulting from the Book of Canons which ordered Anglican practices in Scot., 6-512.

Bis'kra, Algeria. Winter resort and important military post in fertile oasis; pop. 9,000.

Bisley. Village nr. Woking, Surrey; rifle-shooting, 7-44.

Bismarck, Otto Eduard Leopold, Prince von Bismarck-Schönhausen (1815-98). Ger. statesman, creator of Ger. empire, 1-474, 4-9, 6-299, 7-453; Franco-Prussian War, 3-458.

Bismarck. Cap. of N. Dakota, U.S.A.; pop. 18,640, 3-28.

Bismarck. Ger. battleship of 56,200 tons; on May 21, 1911, she sank the *Hood* and damaged the *Prince of Wales* and escaped; hit by a torpedo from a Swordfish from aircraft-carrier *Illustrious*, she was finally sunk by a torpedo from cruiser *Thetis* on May 27.

Bismarck Archipelago. Pacific Ocean Group of Isls. N.E. of New Guinea, including New Britain, New Ireland, Admiralty Is., 6-26.

Bismuth (Bi). Metallic element, atomic weight 209; atomic no. 83; 1-475, 3-221; alloys, 1-114, 115, 116; anti-magnetic, 5-84; meals for X rays, 7-507.

Bison or American "buffalo," 1-475 3-312.

Bit, used in drilling wells, 1-255.

Bites, by animals and insects, first and for, 3-368.

Bithynia. Anc. country of N.W. Asia Minor on Black Sea.

Bitlis [bit'lis]. Trade centre in Asiatic Turkey; pop. 15,000; occupied by Rus. (1916) in 1st World War.

Bitolj. Yugoslav name for town better known as Monastir.

Bitter almonds, oil of, or benzaldehyde 5-506.

Bittern. Marsh bird, heron type, 1-476; protective coloration, 6-296.

Bittersweet or woody nightshade.

Hodgerson plant, 1-477.

Bitumen, 1-274; ancient use, 6-119.

Bivalves. Molluscs having two shells, e.g. oyster and mussel, 7-21; oysters, 6-21.

Bizerta. Spt. and naval station of Tunisia, N. Africa; pop. 39,427; has dockyards and fisheries, 7-325.

Bizet [bē'zā], Georges (1838-75). Fr. musical composer; *L'Arksienne* 3-33, *Carmen*, 5-516.

Björnson, Björnstjerne [byō'nst'jærnā byō'nson] (1832-1910). Norwegian poet, dramatist, novelist and politician; historical dramas made him world-famous; played part in arrangements for separating Norway and Sweden in 1905.

Björnsson [byō'n'son], Sveinn (1881-1952). Icelandic statesman; regent in 1941, when Iceland became independent of Denmark; prime in 1944 when Iceland became reppb.

Black, Adam (1784-1874). (Scot. publisher and politician; founded A. and C. Black, who secured copyrights of "Encyclopaedia Britannica" and Scott's Waverley Novels.)

Black, Dr. Joseph (1728-99). Scot. chemist; prof. of chemistry at Glasgow Univ. (1756-66); discovered latent and specific heat; hydrocarbon theory, 1-353.

Black and Tans. Nickname given to a force raised in 1920 by the British Government for service in Ireland and disbanded in 1922. They wore a black beret with a khaki uniform and were attached to the Royal Irish Constabulary.

BLACKBALLING

Blackballing, origin, 1-356.
Black bear, 1-390; cub, 1-392 illus., 5-153 illus.
Blackberry (*Rubus fruticosus*). Fruit-bearing shrub, 1-477; fruit and blossom, 3-484 illus.
Blackbird (*Turdus merula merula*), 1-477; egg, 1-482 illus. f.; plumage, 1-470; song, 1-472.
Black-body radiation, in physics, 6-317.
Black bread, made from rye flour, 6-482.
Blackburn. Cotton manufacturing tn. in Lancashire, Eng.; pop. 111,217, 1-477, 4-444.
Blackcap. Bird native to S. Europe. Male bird has black head, greenish brown body, darker tail and wing tips; underparts grey. Female is generally browner than male; migration, 5-204 illus. f.; song bird, one of the warblers, 7-418.
Black Country. Coal-mining and mfg. dist. in Midlands of Eng. comprising parts of S. Staffs., Warks., and Warwickshire, 7-141, 7-420, 3-249.
Black damp or choke damp. Non-combustible gas occurring in coal mines. Consists mainly of carbon dioxide and nitrogen, and has a suffocating effect.
Black Death (1348-57). Epidemic of bubonic plague that swept Europe in 14th cent., 1-478; carried by rats, 6-365; effect on agriculture, 1-77; and Hundred Years' War, 4-204.
Black Devon, r. of Clackmannanshire, Scot., 2-105.
Black Down. Highest point in Sussex, 1918 ft., 7-196.
Blackdown Hills, Somerset, Eng., 7-81.
Blackett, Patrick Maynard Stuart (b. 1897). Eng. physicist. Awarded Nobel prize for physics, 1948.
Blackface Meets his Neighbours, the story of a young racee, 6-329.
Blackfeet. Tribe of Plains Indians of Algonquian stock, 6-371.
Blackfellows. See **Aborigines**.
Black fever. See **Kala-azar**.
Blackfly. An aphid, 1-182, 183.
Black Forest, Germany, 1-478, 4-1.
Black Friars. See **Dominicans**.
Black frost, 3-177.
Black Hairstreak, butterfly, 2-141 illus.
Black-headed gull, migration, 5-204 illus. f.
Black-headed. Open common and residential dist. in S.E. London; scene of many historic gatherings; rallying place of Wat Tyler and Jack Cade; Rectory Field is h.q. of Blackheath Rugby Football Club, 5-28.
"Black Hole", of Calcutta (1756), 2-172.
Blackhope Sear. Highest point in the Moorfoot Hills, Scot., 5-39.
Blackie and Ginger, *Adventures of*, 1-393.
Black lamp. Gas discharge lamp surrounded by special type of glass that cuts off all but the invisible ultraviolet rays. Used to reveal objects coated with certain luminescent paints or dyes which show up only when the invisible rays of the lamp are directed towards them, 4-443, 144; used for reading laundry marks, 4-454.
Black lead. Mineral form of carbon also known as plumbago and graphite. Chief deposits in Gt. Brit. are in Cumberland. Used to form "lead" in pencils.
Black Leghorn. Breed of poultry, 6-277 illus. f.
Black locust (tree). See **False acacia**.
Black market. The selling of goods in short supply at prices higher than the legal maximum or the usual market price.
Black marten. Animal of the weasel family, 5-138.
Black Monks. Name given to Benedictines from colour of their habit, 3-244.
Blackmore, Richard Doddridge (1825-1900). Brit. novelist, author of *Lorna Doone*, one of the most popular novels of the 19th cent.
Black Mount. Deer forest in W. Highlands, Scot., 2-87 illus.
Black Mountains, North Carolina, U.S.A., 1-185.

Black Mountains. Hills mainly in Breconshire, Wales, partly in Herefordshire, Eng. Waun Fach (2,660 ft.) in Breconshire is the highest point, 2-55, 244; 4-168.
Black Muffed Tumbler. Variety of pigeon, 6-199 illus.
Black mustard, variety of mustard, 5-312.
Black-necked grebe, 4-70.
Black nightshade. Poisonous plant, 5-439, 6-236.
Black olive, a mollusc, 5-232 illus. f.
Blackout. See **Aeronautics** (table).
Black pearls, 6-102.
Blackpool. Popular holiday resort in Lancashire, Eng., on Irish Sea; pop. 147,130; 1-479, 4-144; Tower and circus, 2-405, 1-479 illus., 480.
Black Prince, The (1330-70). Eldest son of Edward III and Philippa of Hainaut. Great soldier and national hero, 1-480; at Crecy, 2-527; at Poitiers, 4-204; Ruby of, 2-536.
Black rat (*Rattus rattus*). Species of rat, 6-365, 5-101 illus.
Black-Red Old English Game. Breed of poultry, 6-277 illus. f.
Black rhinoceros, animal native to Africa, 6-392.
Black Rod, Gentleman Usher of the. Official who carries messages from the House of Lords to the Commons, 6-88.
Black rust, a type of fungus; spores, 6-530 illus.
Black Sea. Between S.E. Europe and Asia Minor, area about 165,000 sq. m., 1-480; map, 1-181, 7-333; ports and rivers, 3-308.
Black sea bream. Fish found off S. coast of Brit., 2-55.
Blackshirts. Name given to the former Fascist party in Italy by reason of their uniform, 7-484; march on Rome, 3-342 illus.
Black slug. A mollusc, 5-232 illus. f.
Blackstone, Sir William (1723-80), Eng. jurist; wrote *Commentaries on the Laws of England*, foundation of legal training; printed text of Magna Carta, 5-81.
Black Stone. Sacred stone set in the Ka'aba shrine at Mecca; pilgrims, 5-155 illus., 156.
Blackstrap. Treacly liquid resulting in course of sugar production, 7-184.
Blackthorn. Tree similar to hawthorn, of the genus *Prunus*; fruits are called sloes, 6-228.
Black-veined White, butterfly, 2-139 illus.
Blackwater, r. of Eng., 40 m., flowing to North Sea, 3-298.
Blackwater, r. of Ireland, chiefly in Cork co.; flows E. and S., 100 m. to sea at Youghal Bay, 4-281.
Blackwater Fever. Acute form of malaria prevalent in tropics.
Black Widow. A spider native to Amer. Female is venomous, $\frac{1}{2}$ in. long, coal black, marked with red or yellow, with hour-glass shaped patch on underside. Male is much smaller, 7-135.
Blackwood, Algernon (1869-1951). Brit. novelist, noted for tales of fantasy and mysticism as displayed in *The Empty House* (1906); *The Centaur*; *Day and Night Stories*.
Blackwood, William (1776-1834). Founder of the Soc. publishing house of William Blackwood and Sons; started *Blackwood's Magazine* April 1817.
Bladder. Organ in higher animals, serving as container for urine before its discharge from the body, 3-90.
Bladder campion (*Silene cucubalus*). Plant, 2-194.
Bladderwort. Insect-eating plant. Three aquatic species occur in ponds in Gt. Brit., 6-218, 217 illus., 5-144.
Bladder-wrack. The common brown seaweed which has small bladders on its fronds. These pop when trodden on, 1-104.
Blade. In botany name given to the thin expanded portion of a leaf, 4-470.
Bladud. Legendary king said to have built city of Bath; made wings for flying, 1-27.

BLIGHTS

Blaeberry. See **Bilberry**.
Blauenau Ffestiniog. Tn. in Merionethshire, Wales; pop. 6,923, 5-175.
Blavenon. Tn. in Monmouthshire; pop. 9,777; coal mines, iron and steel works, 5-215.
Blairgowrie and Rattray. Scot. tn. in Perthshire; noted for fruit; jute mfrs.; pop. 5,383; 6-138.
Blake, Robert (1599-1657). English admiral, 1-481.
Blake, William (1757-1827). Eng. poet and artist, 1-482, 3-273, 3-288; illus. to Book of Job, 4-377.
Blamey, Field-Marshal Sir Thomas A. (1881-1951). Australian soldier; in 1910 C.-in-C. of Australian forces in Egypt; in 1942 C.-in-C. Allied Land Forces S.W. Pacific; reconquered New Guinea; created F.M. in 1950.
Blanc, Louis (1811-82). Fr. socialist who advocated government ownership of railways and public utilities, 7-81; in 1848 revolution, 3-153.
Blanco, Cape, Tunisia, Africa. Most northerly point of Africa, 1-49.
Blanco, Mont. Switz. Highest peak in Alps (15,781 ft.), 1-125 illus., 126; air pressure at top, 1-80.
Blanchard (blahn'shahr), Jean Pierre (1753-1800). Fr. aeronaut first to cross Channel in balloon, 1-354.
Blanche of Castile (1188-1252), Sp. princess, queen of Louis VIII of Fr.; regent during minority of Louis IX.
Blanc Sablon. Southern limit of Labrador, 4-427.
Bland-Sutton, Sir John (1855-1936). British surgeon, 7-195.
Blank verse, Marlowe and, 5-133; Shakespeare's use of, 3-285, 7-12; Milton, 3-286.
Blarney. Vil. in co. Cork, Irish Rep.; castle contains Blarney Stone, 2-505.
Blast and explosions, 3-330 with diag.
Blast furnace, 1-482, 3-190, 4-293, 4-290 illus.
Blatchford, Robert (1851-1943). Brit. author and journalist; assumed pseudonym of "Nunquam" and wrote on socialism, founded *Clarion* in 1891; series of newspaper articles in 1910 on the Ger. menace attracted considerable notice.
Blattnerphone. Early method of recording sound electro-magnetically on a steel tape and of reproducing it by the same means; name from inventor, Dr. L. Blattner.
Blavatsky, Helena Petrovna (1831-91). Rus. founder of Theosophical Society.
Bleaching, 1-483; chlorine in, 2-378.
Bleaching powder. See **Chloride**.
Blcak. A coarse fish, 6-404.
Bleeding, first aid for, 3-366 illus., 368.
Blenethra. Mt. in Lake dist., Eng., 2-847 ft., 4-438.
Blende. Zinc sulphide, also called sphalerite, 7-523; crystal, 3-4 illus.; diffraction pattern, 3-5 illus.
Blenheim. Type of Brit. fighter-bomber plane in 2nd World War; in Battle of Britain, 2-76, 78.
Blenheim, Battle of (1704), 1-484, 5-132.
Blenheim Orange. A cooking and dessert apple, 1-186 illus. f.
Blenheim Palace. Mansion nr. Woodstock presented to 1st Duke of Marlborough, 6-22, 5-132.
Blenkinsop, John (1783-1831). Brit. inventor of a cog rly. (1812) used at a Yorks. colliery; Geo. Stephenson modelled his first locomotive on Blenkinsop's.
Blennies, tropical fish, 3-frontis.
Blériot, Louis (1872-1936). Fr. aviator, 1-485; flew Eng. channel in 1909, 1-39; landing at Dover, 1-33 illus.
Blas, Hendrik (c. 1480-1550). Flemish painter; as landscape painter, 5-381.
Blida. Fortified tn. in Algeria. Noted for orange groves; copper and lead mines; pop. 40,149.
Bligh, William (1754-1817). Eng. admiral; capt. of H.M.S. *Bounty*, the crew of which revolted (1787) and set him adrift in an open boat, 2-27.
Blight. Various plant diseases; moulds and mildews, 5-293; rust fungus, 6-481.

Blimp. Type of non-rigid airship. 1-83. The character Colonel Blimp, representing the fatuous die-hard type of citizen, was originated by cartoonist David Low in 1931.

Blind, Education of the, 1 485; Helen Keller, 4-395; guide dogs, 3 101, 1-152 illus., 6-319 illus.

Blindness, and Vision, 7 104.

"Blind spot" of the eye, how to find, 3-332.

Blind-worm. See *Slow-worm.*

Bliss, Sir Arthur (b. 1891). Eng. composer; Master of Queen's Music from 1953. "A Colour Symphony" (1922), "Viola Sonata" (1933); ballet, "Checkmate" (1937); ballet, "Adam Zero" (1940); opera, "The Olympians" (1949); 5 306.

Blister. A small swelling, holding watery matter; first aid for, 3-308.

Blister beetle. Popular name of *Cantharide* family of beetles, including Spanish fly; habits of, 1-113 illus., 115.

Blister pearls, how formed, 6-102.

Blister steel, 4 295.

Blitzkrieg (blitz'krög; Ger. *Blitz*, lightning flash; *Krieg*, war). A rapid and annihilating military attack; abbrev. "blitz" applied popularly to Ger. air-raid attacks, e.g. the London raids of Sept. 7, 1940-May 10, 1941.

Bloater, or smoked herring, 4 171.

Bloch (blokh), Ernst (b. 1880). Swiss-American composer; orchestral works and chamber music; later experiments in quarter-tones.

Block. See *Nautical Terms* (table).

Blockade. In international law, the severing by a belligerent of sea communications with a territory or place in the possession of the enemy. A belligerent has the right to stop all commerce with ports or coastline of an adversary.

Block-books. Picture books printed from wood blocks, 2-3.

Block printing. Method in use before invention of movable type; in textile dyeing, 3-141.

Bloemfontein. Cap. of Orange Free State, Union of S. Africa; pop. 109,130; 1-488, 5 321 illus.

Bois (blwah). Fr. historic tn. on Loire; pop. 24,600; trade and mfg. centre; splendid castle, once seat of powerful counts of Blois, 6 385 illus.

Blok, Alexander (1880-1921). Russ. poet, 6-480.

Blomfield, Sir Reginald (1856-1912). Brit. architect. Designer of many London buildings; R.A.F. monument on the Embankment; the Menin Gate war memorial at Ypres.

Blondel de Nesle (blon'del de näl). Fr. troubadour, friend and attendant of Richard I.

Blondin, Charles (1824-97). Professional name of Jean F. Gravelet, Fr. showman and acrobat, 1 488.

Blood, 1-489, circulation of, and heart, 4-143, 4-144 diag.; pulse, 6 301; kidneys and circulation, 4 403; in liver, 4 524; in lungs, 5 52; and bone, 1-518; how nourishment reaches blood, 3 90; Harvey's circulation discovery, 4-135; Lindbergh's research on, 4-513; calcium necessary for clotting, 2 166; malaria in blood-stream, 5-92 illus.; in birds, 1-453; of lobster, 4 531.

Blood, Thomas (c. 1618-80). Notorious Irish adventurer who stole the crown jewels from the Tower of London in 1671, 1 493.

Blood groups, 1-491.

Bloodhound. Breed of dog famed for skill in hunting by scent, 3-101 illus., 1, 3-102.

Blood plasma. Blood with red corpuscles removed, used in blood transfusions, 1-490, 491 illus., 492.

Blood-poisoning, after surgical operations, 1-176.

Blood-pressure, 1-492; measurement of, 4-145.

Bloodstone. A coloured variety of quartz, used as a semi-precious stone. Dark green, with red spots; found in India, Burma. Also called heliotrope, 6-320; silica in, 7-53.

Blood transfusion, 1-491 with illus.

"Bloody Aassize, The" (1855). Trial of followers of Duke of Monmouth; Judge Jeffreys and, 4-359.

"Bloody Mary," epithet given to Mary I, Queen of England.

Bloody Tower, part of the Tower of London, 7 301.

Bloomsbury. District of west-central London, contains the British Museum and London University buildings. After the 1st World War it became the home of writers and artists, and the name became popularly connected with intellectual pretension.

Blorango. Hill in Monmouthshire, Eng., 1,834 ft., 5-246.

Blow-fly, or blue-bottle, 3-402; egg, 3-171.

Blowlamp. Portable apparatus for applying intense heat, 1 493.

Blowpipe, in glass making, 4 30.

Blubber. Layer of oily fat immediately beneath the skin in whales, seals and some other marine animals. May be 20 in. thick and nearly half weight of the body. Is important source of oil for cosmetics, margarine, etc. Eaten by Eskimos, 7 115.

Blücher, Gebhard Leberecht von, Prince of Wahlstadt (1742-1819). Prussian general, 1 494; and Napoleon, 5 323; and Waterloo, 7-128, 429.

Blue, pigment, 6 38.

"Blue." A nun who has the right to wear the light blue cap and blazer of Cambridge, or the dark blue of Oxford, blues and half-blues being awarded to those taking part in most inter-university sporting contests, 6 20.

Bluebeard. Fairy tale told by Charles Perrault (1628-1703), pub. in Paris, 1697, 1 494.

Bluebell. Flower, 1 495.

Blueberry. See *Bilberry.*

Blue Bird. Name of Sir Malcolm Campbell's record-breaking motor-cars and motor-boats, 2 192.

Blue Bird, The. Story by Maeterlinck, 5 73.

Blue Books. Name given to parliamentary reports, which are usually bound with blue paper covers and (loosely) other govt. documents, except those of the foreign office.

Bluebottle. See *Blow-fly.*

Bluebottle. Dragon-club-racing-yacht owned by Queen Elizabeth II and Duke of Edinburgh, 7 511.

Blue Boy, The. Painting by Thomas Gainsborough, 3-267 illus.

Bluecoat School. Name (from uniform) applied to Christ's Hospital, Hammersmith (J.-I), and schools at Liverpool (J.-I), Manchester and elsewhere.

Blue butterfly, egg, 3-171 diag.

Blue ensign. Flag of the Royal Naval Reserve, 3-385.

Blue Grotto. Famous cave on isl. of Capri, Italy, 2-276, 278 illus.

Blue gum tree. Species of eucalyptus (E. globulus), 3-306.

Blue magpie, bird, 3-424.

Blue Mountains, N.S.W., Australia; highest point Mt. Neerang, 1,100 ft., 1-316.

Blue Nile. R. in Africa, rises in Abyssinia, unites with White Nile near Khartoum.

Blue Peter. Blue flag with white square in centre, hoisted in a ship about to sail.

Blue-prints, 6-162.

Blue Riband. Formerly the "blue-ribbon," awarded for the fastest crossing of the Atlantic by a liner, was merely a term of honour. In 1935 a trophy was presented by H. K. Hales, M.P.

Blue Ridge Mts., N. Amer. Easternmost range of Appalachian Mts., from Hudson r. s.w. to Georgia; highest peak Mt. Mitchell, 6,711 ft., 5 452, 2-214, 1-185, 7-403.

Blue shark. Variety of shark found around coast of Gt. Brit., 7-18.

Blue squadron. In British navy, a division of the fleet until 1861, 1-20.

Blue-stocking. Term applied to learned, pedantic woman. In the 18th century a literary circle of men and women was established in Lon-

don, among whom was a certain Mr. Benjamin Stillingfleet, who regularly wore blue stockings.

Blue tit. See *Tom-tit.*

Blue vitriol (copper sulphate), 7-187.

Blue whale, the largest known mammal now existing, 7-445, 446 illus.

Blum (bloom), Leon (1872-1950). French politician; leader of Popular (Socialist) Front; premier 1936-37, 1938; liberated from German prison, 1945; premier, Nov. 1947; vice-premier July-Aug. 1948.

Blunden, Edmund Charles (b. 1896). English poet and biographer, winner of Hawthornden Prize in 1922. Created C.B.E. in 1951; 3-291.

Blunderbuss. Heavy pistol with flint-lock trigger action, and sometimes bell-shaped muzzle, in use in 18th cent. often against highwaymen.

Blunt, Lady Anne (d. 1917). Wife of Wilfred Scawen Blunt (q.v.).

Blunt, Wilfred Scawen (1840-1922). Brit. poet and traveller; with his wife, Lady Anne Blunt, visited Nefed, Arabia (1878), 1-195.

Byton, Enid. Brit. writer for children, 2 357.

Boadill (d. c. 1495). Last Moorish King of Granada; massacre of Abencerrages, 1 111.

Boa constrictor. Large snake native to S. Amer., up to 12 ft. long, 7 71, 75 illus., 7-97 illus.

Boadicea (d. c. A.D. 62). Queen of the Iceni, 1-496.

Boanerges (böanér'jéz). "Sons of thunder," name given by Jesus to the disciples James and John; applied to any loud voiced orator.

Boar. Wild swine of Europe and India, 1-496; hunting in Fr. and Ger., 4-210.

Board of Admiralty. See *Admiralty, Board of.*

Board of Trade. See *Trade, Board of.*

Boards, in lumbering, 5-19.

Board schools, 6-501.

Boater, straw hat, 4 137.

Boat Race. Any race between boats, particularly the annual contest between Oxford and Cambridge Universities, 6-159, 1-497, illus.; first race rowed in 1829; recent winners—1913, 1941, Oxford; 1915, Cambridge; 1916, Oxford; 1917-1951, Cambridge; 1952, Oxford; 1953, Cambridge; 1954, Oxford; 1955, 1956 Cambridge.

Boats and Canoes, 1-497; Bolivian craft, 7-96 illus.; canal boats—2-206; anc. Egyptian, 3-201 illus.; lifeboat, 4-493; outrigger canoe, 6 31 illus.; S. Amer. Indian, 1-500 illus.; Red Indian, 1-199 illus. See also *Ships and Shipbuilding; Yachts.*

Bobbin lace. See *Pillow lace.*

Bobbins, in lace-making, 4-133 illus., 1

Boccaccio (bokak'chö), Giovanni (1313-75). "Father of Italian prose"; author of the "Decameron," a storehouse of characters and plots used by Chaucer, Shakespeare, and many others; 6-381, 4 329.

Bochum (bokh'um). Ger. industrial city in North-Rhine Westphalia pop. 290,406; coal mines, iron and steel works, 6-468, 4-4.

Bodhi tree, and Buddha, 1-415.

Bode's Law. Numerical relation to express the relative mean distances of the planets, except Pluto, from the sun, beginning with Mercury. It is obtained by adding 4 to each of the series 0, 3, 6, 12, 24, 48, 96, 192, giving the resulting sequences, 4, 7, 10, 16, 28, 52, 100, 196; dividing these by 10 gives the mean distances of the planets from the sun in astronomical units (q.v.). Established in 1772 by the German astronomer Johann Elert Bode (1747-1826) who based it on a somewhat similar formula drawn up by another German, J. O. Titius (1729-96).

Bodiam Castle, in Sussex, 2-259 illus.

Bodkin, Thomas (b. 1837). Brit. art historian and critic; on Cézanne 2-298.

Bodleian. (bodl'ian) Library, Oxford. Eng. Public library of the Univ.

RODLEY

named after Sir Thomas Rodley who restored and re-opened it in 1602. Extension, New Bodleian, completed 193, opened by King George VI, 1946; 6-20 4-486.

Bodley, Sir Thomas (1545-1613). Eng. scholar and diplomat and Bodleian Library. 4-486.

Bodmin. Tn. in Cornwall on r. Camel. Agricultural centre; annual fairs for cattle, horses and sheep; pop. 6,068.

Body Temperature 7-268.

Boehme (hē'mē), Jakob (1575-1624). Ger. peasant who became a noted philosopher and mystic; *Aurora*, his first published work, and many of his other writings have been extensively translated.

Boeotia [bōē'thiā]. Dist. of anc. Greece, N.W. of Attica. 7-266.

Boers. Dutch settlers and their descendants in S. Africa: Great Trek, 1-51; in Boer War, 1-502; in Orange Free State, 5-524; and Transvaal, 7-308; treatment of natives, 7-90; pioneer monument 6-286 illus.

Boer War (1899-1902), 1-502. ~muts, 7-72. Rhodes, 6-393; Roberts, 6-414 5-325.

Boethius [bōē'thius] (about 480-524). Rom. statesman and philosopher (*Consolations of Philosophy*, trans. by King Alfred and Chaucer).

Bo'for gun. Mobile anti-aircraft gun of Swed. design; 1-174, 173 illus.

Bog, or swamp; peat bog, 6-104.

Bogey, in golf, 4-46.

Bogie, locomotive, 5-4.

Bog moss, 5-273.

Bogotá [bōgō'tah]. Cap. of Colombia; pop. 511,000; 2-459 with illus.

Bog pimpernel. See under Pimpernel

Bohea. Variety of black China tea in 18th cent. bohea meant tea in general.

Boheme, La. Opera by Puccini, 5-516

Bohemia. Former kingdom of Europe now comprising part of Czechoslovakia, 1-503; 3-21; map, 3-22 and Thirty Years' War, 7-269.

Bohemian origin of word 1-501.

Bohemian Forest (Bohmerwald). Chain of mts. between Bohemia and Bavaria, highest peak Arber.

Bohemund I (c. 1056-1111). Prince of Antioch, eldest son of Robert Guiscard, in First Crusade, 3-1.

Bohr, Niels (b. 1885). Dan. physicist, evolved a new theory of atomic structure based on quantum mechanics, 3-221, 1-297 diag.

Bohun, Sir Henry de. English knight who, at battle of Bannockburn, challenged Robert Bruce, King of Scotland but paid for the attempt with his life.

Boiardo (1411-94). It. poet, 4-329.

Boii. Celtic tribe who gave their name to Bohemia, 1-503.

Boileau, Nicolas (1636-1711). Fr. poet, satirist and critic 3-455; Racine and, 6-331.

Boiler, 1-504; of locomotive, 5-2.

Boiling. In cooking, 2-498.

Boiling point, of water 4-148, 6-378, and atmospheric pressure, 7-152.

Boils. Inflammation of the skin and underlying tissue, accompanied by accumulation of pus; first aid for 3-368.

Bois de Boulogne. Large park in Paris, 6-79.

Boise. Cap. of Idaho state, U.S.A.; pop. 34,393, 4-234.

Bois-le-Duc [bwahledook] or 's Hertogenbosch. City of Netherlands; pop. 60,074; noted cath., mfg. shipping.

Bokhara [bōk'hah]. former khanate of Cent. Asia, lying N. of Afghanistan, now city of Uzbek S.S.R. 1-266.

Bolan Pass. Defile 60 m. long in N. Baluchistan.

Boldredwood, Rolf. Pen name of Thomas Alexander Brown (1826-1915). Anglo-Australian novelist, wrote *Robbery Under Arms* (1888).

Bolero. Lively national dance of Spain in 3-4 time with strongly accented rhythm; also, the music to which it is danced. Performed

by two persons, to the accompaniment of castanets and guitar.

Bolero, Anne (1507-36). English, queen's wife of Henry VIII, 1-506 4-164.

Bolgars. People akin to the Huns, ancestors of the Bulgarians, 2-120.

Bolingbroke, Henry St John, 1st Viscount (1678-1751). Eng. statesman and essayist, 1-506.

Bolívar, Simon (1783-1830) [bolí'var] S. American soldier and statesman 1-506, 6-3; and Peru, 6-144.

Bolívar (Ecuador). See Riobamba.

Bolívar. See Money (table).

Bolivia. Inland republic of S. Amer.; area 416,000 sq. m.; pop. 3,900,000; cap. La Paz, 1-507; war with Peru 6-139, 144; boundary disputes with Chile, 2-360; flag, 3-385 illus. 1.

Bolliano. See Money (table).

Bollards. See Nautical Terms (table).

Bologna [bolō'nyah]. Giovanni da (1524-1608). Italianized name of the Fr.-born Jean Boulogne a great sculptor.

Bologna. City of N. It.; pop. 338,000. 1-510

Bologna, University of. Bologna, It., one of oldest European universities; founded 1088 1-143, 7-367.

Bolometer. An electrical thermometer for detecting infra-red rays, 4-260.

Bolsheviks. Russ. revolutionaries, 6-474; Lenin leader of, 4-478.

Bolt of rifle, 3-360.

Bolting cloths. Fine sieves used in flour-milling, made of silk, 7-54.

Bolton. Tn., Lancs., England; pop. 167,162; 1-510; centre of the cotton industry, 3-249.

Bolton Wanderers. Football team 1-510.

Bolyai, Jano (1802-60). Hungarian mathematician; founder of non-Euclidean geometry, 3-515, 5-149

Bo'ma. Late cap. of Belgian Congo; pop. 6,000.

Bomb 1-511; glider bomb, 4-103. See also Atom bomb; Flying bomb

Bombardier. Junior n.c.o. in Brit. artillery. Equivalent to corporal in the infantry.

Bombardier beetle. member of *Carabidae* family, habits, 1-111, 4-266.

Bombay. State of Republic of India, area 108,142 sq. m.; pop. 36,000,000, cap. Bombay city, 1-514, 4-239, 241.

Bombay. City. Cap. of Bombay state, India, pop. 2,839,270; 4-241; Pursees in, 4-242; towers of silence, 6-93 illus.; street barbers, 4-243 illus.; in Indian hist., 4-252.

Bombay duck. Anglo-Indian name for a small fish native to Indian and China coast seas. Salted, dried and eaten with sauces. It has a duck flavour. Also eaten with curry.

Bombazine. Dress fabric in which warp is silk and weft is of worsted. Light in weight; used for mourning clothes. Not made since the 1870s.

Bombidae. The bumble bee family.

Bombycidae. Family of moths.

Bonampak. Anc. Maya city in Yucatan, excavated in 1947; 1-206.

Bonanza. Sp. and Port. word meaning prosperity. Used nowadays for a rich ore deposit. Several Amer. minn. tns. are called Bonanza.

Bonaparte. Family of Napoleon I, 1-517.

Bonaparte, Carlo (d. 1-5). Father of Napoleon I.

Bonaparte, (Maria Annunciata) Caroline (1782-1839). Sister of Napoleon I; wife of Murat, 1-518.

Bonaparte, Charles Joseph (1851-1921). U.S. attorney-general 1906-09; in Bonaparte family, 1-517.

Bonaparte, (Marianne) Elise (1777-1820). Napoleon I's sister; became duchess of Tuscany, 1-517.

Bonaparte, Jerome (1784-1860). King of Westphalia 1807-1813; brother of Napoleon I, 1-517.

Bonaparte, Joseph (1768-1844). King of Naples and Spain; brother of Napoleon I, 1-517, with illus. 5-322.

Bonaparte, Letizia (1750-1836), called Madame Mere. Mother of Napoleon I, 1-517.

BOOK-BINDING

Bonaparte, Louis (1778-1816). Brother of Napoleon I and father of Napoleon III; King of Holland, 5-322, 323.

Bonaparte, Lucien (1775-1840). Prince of Canino, brother of Napoleon I, 1-517.

Bonaparte, Napoleon. See Napoleon.

Bonaparte, (Marie) Pauline (1780-1825). Napoleon I's sister; became princess of Borghese, 1-517.

Bonaventura [bōnaventoor'ah]. Giovanni da Fidanza, St. (1221-74). It. Franciscan, professor of theology at Paris, where he was known as the "Doctor Seraphicus." Became a cardinal by Pope Gregory X (1272); canonized by Pope Sixtus V.

Bond. In bricklaying, 2-117.

Bond. In commerce, a written undertaking, to pay a sum of money or to perform a certain contract.

Bondfield, Margaret Grace (1873-1953). Brit. Labour politician; first woman chairman of Gen. Council of the T.U.C. and first woman cabinet minister, min. of labour, 1929-31.

Bone, Henry (1735-1831). Brit. enamel painter the most famous of his day.

Bono, Sir Muirhead (1876-1953). Brit. etcher and painter. Official war artist, 1916-18, 1916-13, specialist in etchings and scenes of commercial life. His son, Stephen Bone (b. 1904), is also a well-known artist. His brother, James Bone (b. 1872), wrote books which Muirhead illus.

Bone, 1-518: in skeleton, 7-60; of skull, 7-61; foods necessary for, 3-109; calcium phosphate in, 6-162; and types of horn, 4-193, 194-bone glue, 4-36.

Bone-black. See Animal charcoal.

Bone-marrow. blood-formation in, 1-518.

Bone porcelain. invented by Josiah Spode, 6-277.

Bo'ness. Tn. in West Lothian, Scot. pop. 11,135, 5-39.

Bonet, Juan Pablo (1560-1620). Spanish writer on education of deaf, 2-56.

Bonfires and Easter festival, 3-135.

Bonheur, Rosa (Marie Rosalie) (1822-99). Fr. artist, notable animal paintings, including "Horse Fair."

Bonhomme Noël. French name for Father Christmas.

Boniface, Saint (680-755). Apostle of Germany, 1-519, 1-387; 4-5.

Boniface. Name borne by nine Popes, 1-519.

Boniface I. Pope 118-22, 1-519.

Boniface VIII. Pope 1294-1303, 1-519.

Boniface IX. Pope 1389-1404, 1-519.

Bonifacio [bonah'chiō]. Strait of. Between Sardinia and Corsica.

Bonington, Richard Parkes (1801-28). Eng. landscape painter, has been called "the Kents of Eng. painting."

Bonin [bōnin] Islands. Group of 20 volcanic isls. in Pacific, 40 sq. m.

Bonito. A fish of the mackerel family.

Bonn. Tn. in North Rhine-Westphalia, W. Ger.; cap. of W. Ger. Federal Republic; pop. 115,390 (1950); 1-520, 4-11.

Bonn, University of. At Bonn, Ger.; faculties of law, medicine, philosophy, theology, ranked 2nd among leading German universities.

Bonner, Edmund (c. 1500-69). Bishop of London and chaplain to Cardinal Wolsey; notorious for his persecution of Protestant martyrs.

Bonnet [bonā], Georges (b. 1889). F. politician; foreign min. at time of Munich agreement, 1938; in 1941 member of Vichy govt.

Bonnet. Head covering, 4-136.

Bonnie Prince Charlie. See Stuart, Charles Edward.

Bontoks. Primitive native people of Philippine Isls., 6-156.

Bonus. See took Exchange Terms.

Bony labyrinth. Of ear, 2-147.

Bonzo. Monk of a Buddhist monastery in the Far East.

Boodle's Club. St. James's St., London, 1-14 illus.

Book-binding. 2-8, 9, 10 with illus.; early books, 2-4; Grolier binding, 2-9 illus.

BOOK-KEEPING

Book-keeping, 2-10; for carvers in book-keeping *see* Accountant.
Booklets (*Psalms*), 2-12.
Book of Kells. *See* Kells, Book of.
Book of the Dead. Collection of anc. Egyptian prayers and incantations found in pyramids, 3-193, 192 illus.
Bookplate. Label denoting ownership of a book, 2-12.
Books and their making, 2-1; binding 2-8, 9, 10; bamboo tablets, 2-361; bibliography, 1-414; bookplate, 2-12; book sizes, 2-4; bookworms, 2-12; chained books, 4-488 illus.; library, 4-486; pen, 6-112; handwriting, 7-503; printing, 6-288; in Braille, 1-485 illus., 486; process engraving, 6-292.
Book sizes, 2-4.
Bookworms, 2-12, 7-500.
Boole, George (1815-64). Eng. mathematician; use of algebra in logic, 1-108.
Boon. An obstruction placed at the entrance to harbours and rivers to prevent entry of enemy ships and submarines.
Boom. A spar attached to a ship's mast for the purpose of fixing a sail.
Boom. A period of activity on the stock exchange with demand for all classes of security, causing a general rise in prices.
Boomerang. Curved wooden missile, weapon of Australian aborigines, 2-12, 1-314.
Boot, Jesse, 1st Baron Trent. *See* Trent.
Bootes [bō'ētēz]. Northern constellation containing the bright star Arcturus; near the Great Bear; name means "the ploughman."
Booth, Edwin (1833-93). Amer. actor; foremost Amer. tragedian of his day.
Booth, Evangeline Corv (1865-1950). English-American religious leader; daughter of William Booth; Commander of Salvation Army, U.S.A. (1904); "General" 1934-36, 2-13.
Booth, John Wilkes (1839-65). Amer. actor, assassinated President Lincoln, 4-512.
Booth, William (1820-1912). Eng. religious leader, founder of Salvation Army, 2-13, 6-493.
Booth, William Bramwell (1856-1929). Son of William Booth, whom he succeeded as "General" of the Salvation Army (1912-28), 2-13, 6-493.
Boothby, Thomas (1677-1752). In attributed fox-hunting with hounds in Eng.; and Quorn hunt, 3-426.
Boothia [bō'thiā] Felix. Northernmost peninsula of Amer. mainland.
Bootle, Lanes. Eng. At the mouth of the Mersey; great docks are part of dock system of Liverpool, of which Bootle is virtually a suburb; pop. 74,302; 4-525.
"Bootleggers". Illicit traders in alcohol, particularly in U.S.A., 1-90.
Boots and Shoes, 2-13.
Bopp, Franz (1791-1867). Ger. scholar and philologist; language studies, 6-158.
Boric acid. Also called boric acid; used as antiseptic, 1-177.
Borage [bu'rj]. Type plant of family *Boraginaceae*, hairy or bristly herbs with usually bright blue flowers; used for flavouring drinks.
Borah Peak. Highest mt. in Idaho, U.S.A. (12,055 ft.), 4-234.
Borax, sodium tetraborate, used in metallurgy as flux, in mfr. of enamel, porcelain and glass, as food preservative, detergent and water-softener, and as antiseptic.
Bordeaux. Spt. on W. coast of France. Centre of wine trade; pop. 253,750, 2-16, 3-433, 3-438.
Bordeaux mixture. Fungicide of copper sulphate and milk of lime; preventive or remedy for potato blight, etc.
Borden, Sir Robert Laird (1854-1937). Canadian statesman; Conservative prime min. of Canada, 1911-20.
Border Minstrelsy (1802-03). Collection of ballads made by Sir W. Scott, 1-351.
Borders. The territory on both sides of boundary between Eng. and Scot.

Bordighera. Winter resort on Riviera in prov. of Liguria, It.; pop. 5,700, 6-403.
Bore. Of cannon, 1-258.
Bore. Tidal wave in certain rivers, 2-17; of Amazon, 1-130; Severn bore, 7-5 illus.
Bor-eas. The god of the north wind in Gk. myth.
Borghese, noble family of Italy.
Borghese, Marie Pauline, princess of. *See* Bonaparte, (Marie) Pauline.
Borgia. Span. family which rose to power in Italy during 15th cent., 2-17, 4-313.
Borgia, Cesare, Duke of Valentinois (1476-1507). Son of Pope Alexander VI, 2-17, 18 illus.; Leonardo in service of, 4-483.
Borgia, Francis (1510-72). Member of the Sp. Borgia; famous general of the Jesuits.
Borgia, Giovanni, duke of Gandia (1474-1497). Son of Pope Alexander VI, 2-17.
Borgia, Lucrezia, Duchess of Ferrara (1480-1519). Daughter of Pope Alexander VI, 2-17.
Boric acid. *See* Boracic powder.
Boring, for coal, 2-430.
Boris III (1894-1913). King of Bulgaria (1918-1943), 2-121.
Boris Godunov (c. 1550-1605). Rus. Tsar; gained throne 1588; while regent, bound peasants as serfs to the soil (1587); subject of play by Pushkin, opera by Mussorgsky.
Borja (family). *See* Borgia.
Borja, Alfonso de. *See* Calixtus III (pope).
Borkum. Westernmost is. of the Ger. E. Frisian group, at mouth of r. Ems; about 5 m. long, 24 m. broad.
Bormann, Martin (1900-15?) Hitler's deputy from 1941, and head of Nazi Chancellery; death assumed, 1945. War criminal, tried in his absence at Nuremberg and sentenced to death.
Borneo. Island of Indonesia; area 290,000 sq. m.; British North Borneo (29,500 sq. m.) is a Crown colony; Brunei (2,226 sq. m.) is a protectorate, 2-18, 4-257; Sir James Brooke and Sarawak, 6-498.
Bornholm. Danish isl. in Baltic Sea; area 224 sq. m.; pop. 46,500; pottery mfr., cattle raising, fishing, agriculture, 3-72.
Bornu. Country of the Central Sudan, former Negro kingdom; split up between Gt. Brit., Fr., and Ger. at end of 19th cent. The trib. state of Zander and part of N. Bornu are in French West Africa; and the s.w. portion is in the Cameroons under a British trusteeship from U.N.
Boro Budur. Anc. Buddhist temple in Java, 4-356 illus.
Borodin [borōdīn'], Alexander (1834-87). Rus. composer (*Prince Igor*, opera; symphonies, string quartets, and songs); 5-306, 5-515.
Borodino. Rus. vil.; scene of fierce but indecisive battle (1812) between Napoleon and Russians.
Boron (B). Non metallic element of the aluminum group; atomic weight, 10.82, atomic no. 5; occurs in boric acid and borax; properties, 3-221.
Boron trichloride; shape of molecule, 2-319 diag.
Borotra, Jean (b. 189-). French lawn-tennis player. Winner of singles championship at Wimbledon, 1924 and 1926; Men's doubles championship, 1932, 1933. Member of the French team which won the Davis Cup from U.S.A. in 1927, 4-462.
Borough. An incorporated village, tn., or city originally with privilege of electing M.P.s. managed by mayor, aldermen, and popularly elected councillors, and financed through rates and govt. grants. Co. bors., independent of co. councils, may be set up in tns. over 100,000. Bor. constituencies for local and parl. elections may include bors., urban or rural dists., etc.
Borromeo [borōmā'ō]. St. Carlo (1538-84). Cardinal and Archbishop of Milan; chief figure in last years of Council of Trent.

BOUGAINVILLEA

Borrow, George Henry (1803-81). Brit. writer on gypsy life and lore, 2-20.
Borrowdale. Valley in the Lake dist. of Cumberland, Eng.; wettest place in Eng., 4-439.
Bors, Sir, one of knights of Round Table.
Bort. Small inferior diamond used in industry, 3-84.
Borzoi or Russian wolf-hound, 3-102, 101 illus. f.
Bose, Sir Jagadis Chandra (1858-1937). Indian scientist; invented crescograph for recording life movement of plants. Founded Bose Research Institution, Calcutta.
Bosnia and Herzegovina. State of Yugoslavia; area 19,909 sq. m., pop. 2,563,277; cap. Sarajevo, 2-20, 7-517, 518 and map.
Bosporus or **Bosphorus**. Strait 16 m. long, between the Black Sea and the Sea of Marmara, 2-21; Istanbul on, 4-303.
Bossuet [boswāl], Jacques Bénigne (1627-1704). Fr. preacher, called greatest ecclesiastical orator in history, 3-155.
Boston. Tn. in Linco., England; pop. 21,453; 2-21; Boston Stump, 2-21 illus., 4-512.
Boston. Cap. city of Massachusetts, U.S.A.; pop. 790,563, 2-22, 1-137, 5-114.
Boston Tea Party, 1-137, 5-114.
Boswell, James (1710-95). Scottish writer and biographer of Samuel Johnson, 2-22, 1-116, 4-340, 3-288.
Bosworth Field, Battle of (1485), 2-23, 6-400, 4-163.
Botanical Gardens. Kew garden-4-101.
Botany, 2-24; Linnæan classification 4-515, 4-149; flowers, 3-39; fruits, 3-478; leaves, 4-469; plant life, 6-211; seeds and spores, 6-528; trees, 7-308-316; water-plants, 7-428-430; yeast, reproduction of 7-512-13.
Botany Bay. Inlet on E. coast of Australia, so named by Cook (1770) because of variety of flora, 1-317.
Bot fly. Parasitic fly, common in most parts of the world, whose larva lives as a parasite in cattle, sheep, horses. Also known as warble fly.
Botha, Louis (1862-1919). S. African soldier and statesman. Chief of the Boers in Boer War; first prime min. of Union of S. Africa, 1910-19, 7-72, 7-92; and 1st World War 7-180.
Bothnia, Gulf of. Arm of Baltic Sea between Finland and Sweden, 1-317.
Bothwell, James Hepburn, Earl of (1536-78). Third husband of Mary Queen of Scots; died after eight years' imprisonment in the castle of Braxholm, Denmark; and Casket Letters, 5-112.
Botolph, St. Eng. 7th cent. saint over 50 churches dedicated to him in E. Anglia and Yorks, with two in London; monastery at Boston 2-22.
Botteicelli [botteicel'i]. Sandro (1447-1510). Italian painter, 2-25, 4-318.
The Nativity, 4-323 illus.; Madonna and Child, 6-87 illus.; The Birth of Venus, 7-389 illus.
Bottle-nose whale, 1-160.
Bottles, for poisons, 6-236.
Bottle tree. Evergreen tree native to Australia, 2-26.
Bottomley, Horatio (1860-1933). Brit. journalist; founded and edited *John Bull*; imprisoned for fraudulent conversion 1922-27.
Boucher, François (1703-60). Fr. painter; Mme. de Pompadour, 3-444 illus.; painted an, 3-439 illus.; 3-439.
Boudicaut [bō'dikō], Dion (1822-90). Irish actor and writer of many plays including *The Colleen Bawn*.
Boudicca. *See* Boadicea.
Bougainville, Louis Antoine de (1729-1811). French navigator, 2-27.
Bougainville. Largest and most N. of Solomon Is.; exports copra; area 3,880 sq. m.; pop. 50,000; 2-27.
Bougainvillea. Climbing shrub, 2-27 with illus.

BOUGHTON

Boughton, Rudland (b. 1878). Eng. composer; co-founder of Glastonbury Festival Players; music drama includes "The Immortal Hour."

Bouillon [bɔdɔjɔn]. Anc. duchy in the Ardennes; possession of Godfrey de Bouillon, leader of First Crusade; now comprised in Belg. prov. of Luxembourg.

Boulanger [bɔləɲɑ̃ zɦɑ̃]. **Georges** (1837-91). Fr. general and Royalist plotter; convicted of treason; committed suicide.

Boulder Dam. See **Hoover Dam**.

Boulevard Saint Michel. Famous street in Paris. 6-83.

Boulogne. Fr. apt. almost opposite Folkestone across the Eng. Channel; shipbuilding, fishing, fish-curing; pop. 53,000; Ger. occupation 1940-7-187.

Boult, Sir Adrian (b. 1889). Brit. musical conductor; of Royal Philharmonic Society (1918-19); City of Birmingham Orchestra (1924); musical director of B.B.C. (1930-1942); conductor of B.B.C. Symphony Orchestra (1930-1950); knighted 1937.

Boundary Peak. Mt. in Nevada, U.S.A., 13,115 ft., 5-393.

Bounty, H.M.S.. Mutiny on, 2-27; and Pitcairn Isl. 6-31.

Bourbon, House of. Fr. royal family. 2-28; 3-450, 452.

Bourbon, Charles, duke of (1490-1527). Fr. soldier; in Bourbon family. 2-28.

Bourchier [bɔw'ʃɪər]. **Arthur** (1864-1927). Brit. actor; became joint-manager of the Criterion and later manager of the Garrick both London theatres; translated and adapted many plays.

Bourgeois Gentilhomme, Le. Comedy by Molière. 5-232.

Bourgeoisie [bɔʁʒwɑ̃zɦɑ̃z]. Fr. term for middle classes.

Bourges [bɔʁʒ]. Fr. historic city, mfg. and trade centre; pop. 45,000; fine cath.; eng. and aircraft works.

Bourget [bɔʁʒet]. **Paul** (1852-1933). Fr. novelist and critic. (*Sensations d'Italie*; *Cosmopolis*; *Entre-Mer*).

Bourne, Francis (1861-1935). Rom. Cath. Archbishop; Bishop of Southwark (1897-1903); Archbishop of Westminster (1903); Cardinal (1911).

Bourne, Lieut.-Gen. Sir Geoffrey Kemp (b. 1902). G.O.C. Malaya, 1934-56, 5-47; C-in-C. Middle East, 1956.

Bournemuth. Seaside resort in Hants, Eng.; pop. 144,726, 4-124.

Bournemouth. Brit. air-ship, 1-84.

Bournville. Town in the vicinity of Birmingham, Warwicks. Established by George Cadbury, of cocoa and chocolate fame, as a garden city for employees of the firm, but since made over to trustees as a garden suburb. 1-473, 6-317.

Bourse [bɔʊrs]. In Europe; a stock exchange or money market.

Bouts, Dierick (c. 1410-75). Flemish painter. 5-341.

Bouvet Island, Antarctica; Norway's claim to, 1-170.

Bovey Tracey. Tn. in Devon, Eng.; potteries. 3-82.

Bovidae. See **Cattle**.

Bow. Instrument for projecting an arrow, 1-206; for sounding the strings of a violin, 7-101.

Bow. See **Nautical Terms** (table).

Bow Bells. Famous chime of St. Mary-le-Bow, Cheapside, London; and Cockneys. 5-20.

Bowdler [bɔwd'ler]. **Thomas** (1754-1825). Eng. editor of *The Family Shakespeare*, which excluded all passages that might cause offence; hence the verb "to bowdlerise."

Bowen, Elizabeth D. C. 20th cent. Brit. novelist and critic; characters drawn with subtle delicacy; *The Last September*; *The Death of the Heart*; *The Heat of the Day*.

Bowen, Marjorie. Pen-name under which Margaret G. V. Long (1888-1952) wrote historical romances; *The Tiger of Milan*; *The Netherlands Discovered*.

Bower Bird. 2-28; courtship, 1-457 nest 1-312.

Bowes-Lyon (family); lineage of Elizabeth, the Queen Mother. 3-236.

Bow Fell. Mt. in Lake dist., Eng., 2,960 ft., 4-438.

Bowler hat. Invented by William Coke about 1840 for his game-keepers. 4-137.

Bowline. Knot; uses and how to tie, 4-122, with illus.; on climbers' ropes. 5-244.

Bowls. Game. 2-29.

Bowness-on-Windermere. Village and tourist centre of Westmorland, Eng.; pop. 3,300, 4-438.

Bow Street. London thoroughfare in which stands the chief police court of the metropolis. Built in 1881, it replaced a court established in 1749 which gave its name to the Bow Street Runners, who served writs and acted as detectives until superseded in 1829. 6-247.

Box. Small evergreen tree found on chalk hills in England, whence Box Hill. Wood used for engraver's blocks.

Box calf, type of leather. 4-469.

Boxer. Dog of Ger. origin, medium size, smooth coated, with powerful body; colour red, fawn or brindle. Nose turned up and jaw undershot. 3-101 illus. f.

Box Hill. Beauty spot in Surrey. Eng. 396 ft. 7-195 illus.

Boxing. Sport. 2-29.

Boxing Day (Dec. 26). origin of name, 2-342.

Boxing the compass. 2-475. See **Nautical Terms** (table).

Box kite, type of kite. Franklin and. 4-416, 417.

Boy actors, mummies. 3-115 with illus.; in Elizabethan companies. 3-118.

Boycott, Capt. Charles Cunningham (1832-97). Irish land-agent, first victim of the boycott system. 2-32.

Boycott. 2-30.

Boyd-Carpenter, William (1811-1918). Eng. divine, bishop of Ripon, 1884-1911, and canon of Westminster. 1912-18.

Boyd-Orr, John Boyd Orr, 1st Baron (b. 1880). Brit. physiologist and dietician. Director-General of World Food and Agric. Organization 1945-48; awarded Nobel peace prize, 1949.

Boyle, Robert (1627-91). British scientist. 2-32; experimental work. 2-316; Boyle's law. 3-508.

Boyle's law, in physics. 2-32, 3-508, 510.

Boynes, r. of Ireland, rises in Bog of Allen and flows 80 m. N.E. to Irish Sea. 4-281.

Boynes, Battle of the (1690). 2-32, 4-28; 7-452; celebrated in Ulster. 4-310.

Boys, choosing their careers. 2-222.

Boys' Brigade. An organization founded in 1883—the oldest of its kind—by Sir William A. Smith; its object is to train both mind and body with the aid of discipline and religious teaching; physical training is an important feature.

Boy Scouts. 2-33; Baden-Powell and. 1-315.

Boz. Pen-name adopted by Charles Dickens for his early writings.

Brabantonne [brabantɔn]. La. Belg. national anthem, celebrating establishment of Belgic independence, 1830.

Brabant'. Medieval duchy of Netherlands; now N. Brabant (Nether.) and Antwerp and S. Brabant (Belg.).

Brabazon of Tara, John T. C. Moore-Brabazon, 1st Baron (b. 1884). Brit. airman and politician; the first British air pilot; min. of aircraft production, 1941-42.

Bracciolini, Foggio (1380-1459). Italian scholar of the Renaissance. Restored many lost masterpieces of Latin literature; also an essayist and historian, collections of MSS., 6-386.

Bracegirdle, Anne (c. 1663-1748). Eng. actress. Congreve and Rowe wrote plays for her, and she appeared with Thomas Betterton in *Love for Love* in 1695.

Bracelet. Article of jewelry; origin of, 4-372.

BRAHMAPUTRA

Bracken. A type of fern (*Pteridium aquilinum*). 2-37; uses. 3-346; poisonous to cattle. 6-236.

Bracket. See **Architectural Terms**.

Bracket clock, a descendant of lantern clock. 2-414 with illus.

Brackets, in punctuation. 6-309.

Bract. A modified leaf which protects or supports a bud or flower.

Bradawl. Tool; origin of name 5-313.

Bradbury, John Swanwick Bradbury, 1st Baron (1872-1950). Brit. civil servant; when joint permanent sec. to the treasury his name appeared on the treasury notes issued in 1914; often referred to as "Bradbury."

Bradcock, Edward (1695-1755). Brit. general, defeated and killed in America during Seven Years' War. 7-2.

Braddon, Mary Elizabeth (1837-1915). British novelist chiefly remembered for her novel *Lady Audley's Secret*.

Bradenham ham, curing of, 1-342.

Bradford, William (1580-1657). Mayflower pilgrim. 2nd gov. of Plymouth Colony; wrote *History of the Plymouth Plantation*.

Bradford. Manufacturing city of Yorks, Eng.; pop. 292,391. Chief centre of wool and worsted trade. 2-37, 3-249.

Bradford Grammar School, foundation. 2-38.

Bradford-on-Avon. Tn. in Wilts, Eng.; pop. 5,627; church of St. Lawrence. 1-212 illus.

Bradlaugh [brad'law], **Charles** (1833-91). Social reformer, lecturer, free-thinker, and politician; founded *The National Reformer*.

Bradley, Andrew Cecil (1851-1935). Brit. literary critic; prof. at Liverpool and Oxford univs.; wrote *Shakespearean Tragedy*.

Bradley, Francis Herbert (1816-1924). Brit. philosopher; wrote *Ethical Studies*; *Appearance and Reality*. 6-160.

Bradley, Henry (1845-1923). Brit. philologist; joint editor of *New English Dictionary*; wrote *The Making of English*, etc.

Bradley, James (1693-1782). Eng. astronomer; discoverer of the aberration of light; became astronomer-royal 1742.

Bradman, Sir Donald George (b. 1908). Australian cricketer. 2-38.

Bradshaw, George (1801-53). Compiler of Bradshaw's Railway Guide, 2-38.

Brady, Nicholas (1659-1726). Anglo-Irish clergyman, collaborated with Nahum Tate in the Tate and Brady metrical version of the Psalms, pub. 1696.

Braemar. Village of Aberdeenshire, Scot. Highland games are held annually in Sept.; pop. 1,100.

Braga. Tn. in Portugal; pop. 84,801, 6-267.

Braganza or Bragança, House of. The reigning family of Port. 1040-1853, and of Brazil 1822-89.

Bragg, Sir William Henry (1862-1942). British scientist; Cavendish professor at Leeds 1909-15; Quain prof. of physics London University 1915; awarded O.M. 1931; chief work concerned with X-rays, crystals and radiography. His son, Sir William Lawrence Bragg (b. 1890) awarded (with his father) the Nobel prize 1915, for work on X-rays. 7-508.

Bragi. In Norse myth., god of poetry.

Brahe, Tycho (1546-1601). Danish astronomer. 2-38, 2-491; 4-401.

Brahma. Hindu god regarded by Hindus as creator of the world.

Brahmaea wallisii. Moth. 2-143 illus.

Brahmanism. Religion of Hindus. 4-178, 1-269.

Brahmans. Priestly caste amongst Hindus. 4-178, 4-242, 1-262.

Brahmaputra [brə'mapʊtrə], r. of India; rises in Tibet and flows E. 800 m., bending S. breaks through Himalayas and flows S.W. to Ganges. 1,800 m., 1-268; Assam earthquakes, 1-276; 6-44.

BRAHMS

Brahms, Johannes (1833-97). Ger. pianist and composer, 2-39; symphonies, 5-305.

Braid, James (1870-1950). Scot. golfer; won Open Championship 1901, 1905, 1906, 1908, 1910; 4-44.

Braidwood, Thomas (1715-1806). Scot. teacher; founder of first school for deaf in the U.K., 3-56.

Braila [brɪˈlaɪ]. Rumanian port on Danube; pop. 97,300; former Turkish fortress; 3-310 illus., 6-470.

Braille [brɑːˈleɪ], **Louis** (1809-52). Fr. educator and organist, inventor of Braille (brɑːˈleɪ) system of printing for the blind, 1-485.

Braille. System of printing for the blind; Braille book, 1-485 illus.

Brain, 2 40; in anatomy, 1 143; of apes and Man, 1-180; and colour vision, 2 465; and hearing, 3 117 with diag., 3-118; psychiatry, 6-200.

Brake fern. See **Bracken**.

Brakes, 2 42; in locomotive, 5-4; in motor-bus, 5 270; in motor vehicle, 5-282, 283 diag.

Bramah [brɑːˈmɑː], **Joseph** (1719-1814). Brit. inventor of hydraulic press and other machines, and of a type of lock, 4-534.

Bramante [brɑːˈmɑːnt], **Donato** (1444-1514). It. Renaissance architect, reconstructed Vatican and St. Peter's.

Bramble. See **Blackberry**.

Brambling, a fish. Winter visitor to Britain from Scandinavia. White on back, 3-353; migration, 5 201 illus. f.

Bramley's seedling. Cooking apple, 1-186 illus. f.

Brans. Meal obtained from the husk of grain during milling. Rich in vitamin B, 3 391, 7 448.

Brandenburg. Ger. Nucleus of modern Prussia, 6 298.

Brandenburg Gate. Berlin, Ger., built 1788-91; marks boundary between E. and W. Berlin, 1-433 illus.

Brandes [brɑːˈnɛs], **George** (1842-1927). Danish author and literary critic (*Myth Currents of the 19th Century*).

Brandon. Tn. in Manitoba, Canada; pop. 20,598; 5 115.

Brandt, Georges (1691-1768). Swed. chemist; and element cobalt, 2 434.

Brandy. Spirituous liquor obtained by distilling wine or the fermented juice of fresh grapes, 7 136, 3-94; as an anaesthetic, 1 112.

Brandywine Creek, U.S.A. Tributary of Delaware in Pennsylvania and Delaware; Howe, the English commander, defeated Washington at Chadd's Ford (1777).

Brangwyn, Sir Frank (1867-1956). Eng. painter, master of rich colour and broad design. Etchings, large in scale, virile in line, prized by collectors. Mural paintings in Royal Exchange (London), Rockefeller Centre (New York), etc., 3 273, 300.

Brantly [brɑːˈnɛl] **Edouard** (1846-1940). Fr. scientist; his invention of the Brantly coherer, a method of detecting Hertzian waves, greatly assisted Marconi, 6-311.

Brantly tube. One of the earliest forms of coherer. Consisted of two electrodes immersed in iron filings, contained in a glass tube. Used in early radio-telegraphy experiments to detect electromagnetic waves, but later improved on by Marconi. Named after its inventor, 5 122.

Brant goose. See **Brent goose**.

Branting, Hjalmar (1860-1925). First Socialist prime min. of Sweden, 1920, again 1921; Nobel peace prize, 1921.

Braque [brɑːˈk], **Georges** (b. 1881). Fr. painter of still-life studies in which abstract pattern and design are all-important, 3-149.

Brasenose College, Oxford. foundation, 6-17.

Brasov [brɑːˈsoʊ], Rumania. Formerly Kronstadt; has anc. 14th cent. fort; banking and commercial centre; pop. 85,200.

Brass. An alloy of copper and zinc, 2-44; varieties, 1-115; lacquer for, 4-133.

BRIARWOOD

Brasses, monumental, in churches, 2-11.

Brassica. Bot. species, including cabbage, cauliflower, turnip, etc., 2-151.

Brassica campestris. See **Rape**.

Brassicacea. See **Cruciferae**.

Brassie, a wooden golf club, with a brass plate on the sole.

Brass instruments (music); limitation of key in, 4-194.

Bratislava. Tn. in Czechoslovakia, on Danube; pop. 172,700, 3-22.

Brauohitsch [brɔʊˈhɪtʃ], **Field-Marshal Walther von** (1881-1918). Ger. soldier; c.-in-c. Ger. Army, 1938-41; dismissed by Hitler after Russian reverses; died while awaiting trial for war crimes.

Braun, Eva (d. 1945). Wife of Adolf Hitler, 4 181.

Brawne, Fanny (1800-65). Keats and, 4-395.

Bray. Village in Berks, Eng., 11 m. S.E. of Maidenhead. Famous in the song *The Vicar of Bray*.

Brazil, Angela (d. 1947). Brit. author of fifty children's books, mostly about girls' schools, and an autobiography, 2 356.

Brazil. Republic of S. Amer.; area 3,288,000 sq. m.; pop. 52,645,000; cap. Rio de Janeiro, 2 46; map, 2 46; negro pop., 5 362; history, 2 19; 1-131; diamonds, 3 53; boundary dispute with Peru, 6 139; New Year customs, 5-410; stamp, 7 113 illus.; flag, 3 385 illus. f.

Brazilian cotton. See **Kidney cotton**.

Brazil nut, 5-187, 7 99 illus.

Brazza, Count Savorgnan de. French explorer and administrator; work in Congo, 2-183.

Brazzaville [brɑːˈzɑːvɛl]. Tn. of Fr. Equatorial Africa; cap. of Middle Congo Territory, 2 482.

Breach of promise, 5 131.

Breadalbane. Mountainous dist., 1,000 sq. m. in W. Perthshire, Scot. Has extensive deer forests and is famous for lake and river fishing.

Bread and biscuits, 2 50; types of flour used, 3-394; home-baking, 2-497; yeast 7-512.

Bread-fruit, 2-52, 2 51 illus.

Break. See **Nautical Terms** (table).

"Breakfall", in Jujitsu, 4-385.

Breakfast, meal; pre-war English, 5 151.

Breakpear, Nicholas. See **Adrian IV** (popé).

Breakwater, 2-54.

Bream. Fish, 2-54; bait for, 3-383.

Breast-bone, or **sternum**, in skeleton, 7 60.

Breasted, James Henry (1865-1935). American archaeologist; professor of Egyptology (*Ancient Times: the History of the Early World*).

Breastplate or **Cuirass**. In armour, 1 213, 244.

Breast stroke, in swimming, 7-207, 209 illus.

Breathing, health and correct breathing, 4 224; in diving suits, 3-95; importance of correct breathing in singing, 7 57; how fish breathe, 3 377. See also **Lungs**; **Respiration**.

Brecknockshire. See **Breconshire**.

Brecon. Co. tn. of Breconshire, Wales; pop. 6,166; woollen goods and hosiery made, 2-55.

Breconshire. Co. G. Wales; area 734 sq. m.; pop. 56,184; co. tn. Brecon, 2-55.

Breda [brɛˈda], Netherlands. Tn. pop. 92,740; once important frontier fortress, repeatedly taken by Sp. and Fr.; residence of Charles II during exile; surrender of picture by Velazquez, 5-115 illus.

Breoch, of gun, 1-259.

Breches Bible, The (1560). Eng. version pub. at Geneva; reason for name, 1-143.

Breches-buoy, sling apparatus used in saving life from wrecks, 6-122.

Breeding of cattle, 2-273.

Breitenfeld [brɛˈtɛnfɛld], Ger. Village of Saxony; Swedish victories (1631, 1642) in Thirty Years' War.

Bremen. Ger. city in the *Land* (state) of Bremen, Federal Repub. of W. Germany. Pop. of city, 456,582.

Pop. of *Land*, 572,587. Area 156 sq. m., 2-55, 4-3.

Bremerhaven [brɛˈmərhaʊfən]. Ger. spt. on Waser; pop. 24,500.

Bren (from name of Czech town, Brno, and Enfield). Army light machine-gun, 5-61.

Brendon Hills. Range of limestone hills in W. Somerset, 7-81.

Brennan, Louis (1852-1932). Irish engineer, invented Brennan torpedo and gyroscope monitor, 4-114.

Brenner Pass, lowest pass over Alps (4,500 ft.), between Ger. and It.

Brennus. Chief of Gauls; led invasion and sack of Rome in 390 B.C.

Brentford. Co. tn. of Middlesex, Eng. part of the combined bor. of Brentford and Chiswick, 5-27, 5-200.

Brentford of Newick, 1st Viscount (1565-1932). Brit. politician; as William Joynson-Hicks was minister of health (1923) and home sec. (1924-29).

Brent (or brant) goose. Species of wild goose, 4 17.

Brentwood. Tn. in Essex, Eng. pop. 29,898; industries brewing and brick making, 3 298.

Brera Palace, Milan, It. art collection, 5-205.

Brer Rabbit. Animal in Joel Chandler Harris's *Cycle Remus*; constantly outwits the stronger animals, his enemies.

Brescia [brɛʃˈtʃə], It. Anc. city at foot of Alps; pop. 123,000; Rom. remains; firearms, textiles, paper.

Breslau [brɛzˈlɔʊ], Ger. name of Silesian city under Polish admin. since 1945. Pop. 289,734 6 238.

Breslau, Peace of (1742), ended first Silesian War; Austria to grant Silesia to Frederick of Prussia.

Bressey, Sir Charles Herbert (b. 1874). Brit. engineer; principal technical officer to ministry of transport (1928-35); prepared Highway Development Survey of Greater London, 1938.

Brest. Fr. spt. on coast of Brittany, pop. 71,991, 2-55.

Brest-Litovsk. Tn. of White Russia on R. Bug; pop. 30,000; rly. and mfg. centre; taken by Ger. in 1915. treaty of (1918), 7 482; scene of meeting of Ger. and Russ. forces Sept. 1939; ceded by Poland to Russia, 1916.

Brigny, Treaty of (1360), in Hundred Years' War, 1 180, 4 204.

Bretons. People of Brittany; customs and language, 2-90.

Bretton Woods. Town in New Hampshire, U.S.A., where in July 1944 U.N. representatives set up an International Monetary Fund to grant loans to member nations, 3-119; 4 13.

Breuer [brɔɪˈer], **Josef** (1842-1925). Austrian nerve specialist; associated with Sigmund Freud in development of psycho-analysis.

Breughel. See **Brueghel**.

Breviary [brɛˈvɪrɪ]. Book used in Roman Catholic Church containing daily service for the canonical hours.

Brewing, hops for, 4 192; yeast in, 7 512; as a career, 2-231.

Brewis. Kind of broth, 5-152.

Brewster, Sir David (1781-1868). Scot. scientist; invented the kaleidoscope in 1816 and perfected the stereoscope, 2-56, 7-156.

Brewster, William (c. 1560-1661). Mayflower Pilgrim leader; one of the founders of Plymouth, U.S.A., 6-202.

Brian Boru, or **Brian of the Tribute** (926-1014). "High king" of Ireland, 1002-11; victor over Danes at Clontarf, where he was slain; and Armagh cath., 1-242.

Briand, Aristide (1862-1932). Fr. politician, 2-56; and Stresemann, 4 10; and League of Nations, 4-161.

Briar. In general, any prickly or thorny shrub. Botanically the sweet briar and the dog rose.

Briareus, in Greek myth., had 100 hands and 50 heads, a son of Uranus and Gaia, 7-370.

Briarwood. Used for tobacco pipe from *Erica arborea*, 4-149.

“BRICK EARTH”

“Brick earth.” Is brick-making, 2 57.
Bricklaying. asphalt damp-courses, 1-275.
Bricks and Tiles. 2-57; bricklaying, 1-112, 111 illus.; sun-drying in Egypt, 3-181 illus.
Bridewell. Originally royal palace in London, named after St. Bride's Well in the vicinity; afterwards for 300 years used as reformatory.
Bridge. See **Nautical Terms** (table).
Bridge. 2-61; Clifton suspension bridge, 2-72 illus.; Golden Gate suspension bridge, 6-497; bridge built by Robert Stephenson, 7-155; Roman, 6 416 illus.
Bridge, Sir Frederick (1844-1921). Eng. musician; organist Manchester cath. (1869-75); deputy organist (1875-92) and organist (1882-1914) at Westminster Abbey.
Bridge of Sighs. Covered bridge in Venice; so called because condemned prisoners formerly passed over it from the judgment hall to execution, 7-387; similar bridge at Cambridge, 2-183 illus. f.
Bridgeport, Conn., U.S.A. 2nd city of state; spt. on Long Island Sound; important mfrs.; pop. 158,700.
Bridges, Robert Seymour (1811-1930). Eng. poet, 2 68; Poet Laureate, 6 242; spelling reform, 7-130.
Bridget, Brigit, or Brigid, St. (A.D. 421-523). One of the three great saints of Ire.; founded church and monastery of Kildare.
Bridget of Sweden, Birgitta, or Brigitta, St. (1303 ? 73). Founder of Brigitines, order of nuns; patroness of Sweden; festival, Oct. 8.
Bridgetown. Cap. of Barbados, Brit. W. Indies; pop. 14,000; 1 366.
Bridgewater Canal. Artificial waterway 12 m. long between Worsley and Runcorn, Eng.; 2 205; influence on Manchester, 6-111; aqueduct over ship canal, 1 190, 2 204 illus.
Bridging. See **Architectural Terms** (table).
Bridgman, Laura (1829-89). Amer. blind deaf-mute. Teacher of blind children, 1 485; Helen Keller and, 4 395.
Bridgnorth. Tn. in Shropshire, Eng., on r Severn; industries incl. tanning, mauling and mfr. of carpets and worsteds; pop. 6,241, 7 45.
Bridgewater. Spt. tn. in Somerset, on r Parrett; pop. 22,221; 7 85.
Bride, James. Pen name of Scottish dramatist O. H. Mavor (1888-1951); made C.B.E. 1916; plays include *Tobias and the Angel*; *The Steaming Croquetman*; *The Black Eye*; *John Knox*; *Dr. Angelus*; *Daphne Laureola*; 6 514.
Bridlington. Tn. in E. Riding of Yorks, Eng. Believed to have been the site of a Roman encampment; has 13th-15th cent. Priory church; Bridlington Quay has harbour, fine sands and promenade; pop. 24,767.
Bridport. Tn. in Dorset; rope, sail cloth mfrs., pop. 6,273.
Brie (bré). Anc. dist. of Fr. between rivers Seine and Marne; noted for cheese, 2-314.
Brieux (bré) Eugène (1858-1932). Fr. dramatist noted for sensational treatment of social subjects.
Brig. Square-rigged, two-masted sailing vessel. Old naval brigs mounted 12 guns on a single deck.
Brigade. A sub-division of an army (armoured, cavalry or infantry) under the command of a brigadier; its composition varies in different countries; in Brit. army, 1-253; in Royal Artillery, 1-261.
Brigadier. In Brit. army, commander of a brigade. Ranks immediately above a colonel, below a major general. Insignia: three stars in form of triangle, surmounted by a crown.
Brigantine. Sailing vessel resembling a brig, except that it is schooner-rigged on mainmast. Much used in days of Mediterranean piracy.
Briggs, Henry (1861-1930). Inventor of logarithms, 5-17.

Brighthouse, Harold (b. 1882). Eng. playwright; author of several one-act plays, 3-291.
Bright, John (1811-89). Eng. Liberal statesman, 2-69; and Cobden, 2-135.
Brightlingsea. Spt. of Essex, on Colne estuary; oyster fisheries and boat-building; pop. 4,500.
Brighton. Popular seaside resort in Sussex, Eng.; pop. 156,140, 2 69; electric rly., 6-356 illus.
Bright's disease. Inflammation of the kidneys, 4-403.
Bright, St. See Bridget, St.
Brigitia, St. See Bridget of Sweden.
Brill. Flat fish of the turbot family. Native to Brit. and European waters. Weight approx. 8 lb.
Brimstone. Old name for sulphur, surviving in brimstone and treacle, popularly used for purifying the blood.
Brimstone butterfly. 2 140 illus.
Brimstone moth. 2 144 illus.
Brindisi (brin'dizl). Italy. Anc. Brundisium, chief Rom. spt. on Adriatic; Rom. ruins; pop. 41,700.
Brindley, James (1716-72). Brit. engineer; builder of the Bridgewater Canal; patented an improved steam engine in 1758; wrote with difficulty, 2 206.
Brinell Hardness Test. Method of determining the hardness of a metal or a metal alloy by measuring the indentation produced on its surface by a hard steel ball under applied pressure. Another method the Tukon test, uses a diamond-pointed pyramid applied under pressure.
Brisbane, Sir Thomas (1773-1860). Governor of N.S.W., Australia; foundation of Brisbane, 2 71.
Brisbane. Cap. of Queensland, Australia; pop. 121,000, 2-71, 6-323 illus.
Brisbane, R. of Queensland, Australia. about 200 m. long, flowing into Moreton Bay, 6 322.
Briais. In Homer's *Iliad*, a slave girl belonging to Achilles, who quarrels with Agamemnon over her, 1 10.
Brisot (bréso), Jean or Jacques Pierre (1754-93). French revolutionist; leader of the Girondists, who were originally called Brissotins; for opposing the trial of the king, he was arrested and executed.
Bristol. Eng. seaport, cathedral and university city, mainly in Glos., partly in Somerset; pop. 442,280, 2 71; Cabot and Cabot Tower, 2 156 illus.; in Middle Ages, 3 277, and exploration, 1 131.
Bristol Britannia. Turbo prop. airliner, 1-26, illus., 1 41.
Bristol Channel. Inlet of the Atlantic between Wales and England, 2 73, 3 241.
Britain. British history up to 820, 2-73; druids, 3-127; anc. agricultural systems, 1 72; copper mining, 2 503; tin and Phoenician trade, 3 275. For geography and later history see **British Isles**; **England**; **Scotland**; **United Kingdom**; **Wales**.
Britain, Battle of 2 76, 7 188-89.
Britannia. Female figure symbolic of Britain, 2 79.
Britannia. Brit. royal yacht, 1,000 tons, launched 1953. Designed for conversion to hospital ship in war-time.
Britannia. Class of steam locomotive on British Railways, 5 1, 2 79.
Britannia bridge. Over Menai Strait, Anglesey, Wales; built by Stephenson, 2-62, 1-150 illus.
Britannia metal. alloy of tin, antimony, copper, and sometimes zinc; proportions vary according to use, 1-176.
Britannia Royal Naval College. Dartmouth. Training establishment for Brit. naval officers, 2 79, 5 356.
Britannicus (d. A.D. 55). Son of Rom. emperor Claudius; murdered by Nero, 5-367. He is subject of a tragedy by Fr. dramatist Racine.
British Academy. Institution for historical, philosophical, and philological studies, founded 1901, chartered 1902.
British Airways. Brit. air transport company, formed 1936; absorbed by B.O.A.C. (1939), 1-85.

BRITISH NORTH BORNEO

British and Foreign Bible Society. translations of Bible, 1 410; Borrow and, 2 20.
British and Foreign School Society. schools founded by, 6 501.
British Army of the Rhine (B.A.O.R.). Formed on Aug. 21, 1915, from the Brit. Liberation Army (B.L.A.) as the occupation forces of the Brit. zone of Germany.
British Association. for the advancement of science in all its branches; was founded by Sir David Brewster and others in 1831. Chief function is the holding of an annual conference, at which an address is delivered by some eminent man chosen President for the year.
British Broadcasting Company. Commercial organization estab. in Britain in 1922 to broadcast daily programmes; later became the British Broadcasting Corporation, 6-346 illus.
British Broadcasting Corporation (B.B.C.). Public corporation, created by Royal Charter in 1927; programmes, 6 346, 347 illus., 348.
British Columbia. Province of Canada; area 366,000 sq. m.; pop. 1,165,210; cap. Victoria, 2 80.
British Commonwealth. Community of nations which has developed from the Brit. Empire; pop. (incl. Crown colonies and protectorates) 555,000,000; area 14,435,000 sq. m. 2-82; development of air routes, 1 85; Cabinet govt., 2 152; high commissioners, 1 131.
British Constitution. See **Constitution**.
British Council. Organization for spreading knowledge of Brit. culture and life in foreign countries.
British East Africa. Territory in centre of E. coast incl. Kenya, Tanganyika, Uganda and Is. of Zanzibar and Pemba; and development in Commonwealth, 2 81.
British Empire. See **under British Commonwealth**.
British Empire, Order of the 5 530, 4 418.
British European Airways Corporation. Public corporation for air transport, formed 1913, 1 86.
British Expeditionary Force (B.E.F.). (1) Name for all British fighting forces in France and Belgium 1911-18; (2) name for British army forces in France and Belgium 1939-40; evacuated from Dunkirk, 3 136.
British Guiana. Crown colony in S. Amer.; area 83,000 sq. m.; pop. about 125,126; cap. is Georgetown, 4 102; stamp, 7 113.
British Honduras. 2-292, 293, 4 101.
British Horse Society. and encouragement of horse riding, 6-401.
British Industries Fair (B.I.F.). Annual trade fair of Brit. goods held in London by Board of Trade to promote U.K. export trade. First held in 1915, 3 328.
British Isles. Name applied to Gr. Brit., Channel Isles, Ireland, Isle of Man, and numerous surrounding isls.; area 121,633 sq. m.; 2 85; weather, 5-179 illus.; rainfall, 6-361; Celts in, 2-288; gypsies, 4-109; in 2nd World War 7-188. See also **England**; **Ireland**; **Scotland**, etc.
British Legion. organization founded in 1921; membership is open to ex-Servicemen and women, and certain others who served with the forces in the World Wars; 4-476; 4-117; Poppy Day, 6-384.
British Liberation Army (B.L.A.), 1944-45. 21st Army Group (Brit. 2nd Army and 1st Can. Army), commanded by F.-M. Montgomery.
British Medical Association (B.M.A.). Organization estab. 1882; publishes the *British Medical Journal* and looks after interests of profession.
British Museum. London, 2-88; foundation and Sir Hans Sloane, 5-299; architectural style, 4-91; library, 4-487.
British National Anthem. 5-325; John Bull and, 4-378.
British North Borneo. Crown colony; 29,500 sq. m.; pop. 351,000, 2 19

BRITISH OVERSEAS AIRWAYS

British Overseas Airways Corporation (B.O.A.C.). Govt.-owned air transport organisation, formed 1940, 1-85, 2-73; coat of arms, 4-165 illus. f.

British Railways. Name adopted for the rly. of the U.K. on their nationalisation, Jan. 1, 1948: 5-1: 6-356.

British Somaliland, protectorate in N.E. Africa bordering Gulf of Aden: 68,000 sq. m.; pop. est. 700,000: chief tn., Berbera 7-84.

British South Africa Company. Founded in 1889 by Cecil Rhodes to develop the territory later known as Rhodesia, 6-393, 394.

British South American Airways. Public corporation for air transport, formed 1946, amalgamated B.O.A.C. 1948, 1-86.

British Standards. Standards of quality, design, method, or process, for the products of all branches of British industry. The standards are fixed by the British Standards Institution formed 1901. A committee representing over 40 different industries fixes the standards, which are recognized by the British government. In 1954, about 1,800 British standards had been issued; they are added to at the rate of 100 a year. All standards are periodically revised.

British Thermal Unit, 4-148, 148.

British West Africa. The territories of Nigeria, Gambia, Sierra Leone, and Gold Coast, with parts of Togoland and Camerons under trusteeship agreement: 7-440-441, and development in Commonwealth, 2-84.

British West Indies. Six groups of islands between N. and S. Amer. dividing Atlantic from Caribbean and Gulf of Mexico. (1) Bahamas (for geographical purposes); (2) Barbados; (3) Jamaica with Turks Is.; (4) Leeward Is.; (5) Trinidad with Tobago; (6) Windward Isb., 7-442.

Britanny, France: area 13,750 sq. m.; pop. 3,061,884, 2-90, 3-433, 7-162.

Britten, Benjamin (b. 1913). Brit. composer: 5-306; opera, 5-516.

Brigham, Tn. and harbour in Devon, Eng.; here, in 1688, landed William of Orange (later William III), 7-452, 453 illus.; 3-81 illus.

Brno (brnô) or Brunn. City in Czechoslovakia, pop. 273,000; gives its name to Bren gun; industries, 3-22, 23 illus.

Broad bean, 1-390.

Broadcasting. See Radio; Radio Communication.

Broadcasting House, Portland Place, London, headquarters of Brit. Broadcasting Corporation.

Broad Law. Highest summit in Peebleshire, Scot. (2,754 ft.), 6-104.

Broad-leaved trees, one of the two great groups into which trees are divided as opposed to the conifers, with needle-like leaves.

Broadmoor. State mental hospital for criminal lunatics at Sandhurst, Berks, Eng. Opened, 1861.

Broads, The. Dist. in Norfolk and Suffolk consisting of a number of shallow lakes and reed marshes: sailing, 5-448.

Broadstairs. Seaside resort, Kent, Eng., pop. 15,082, 4-398.

Broadway, vil. of Worcestershire, with Tudor stone houses and old inn.

Broadway. Famous thoroughfare in New York, 5-413, 414.

Broadwood, John (1732-1812). Eng. piano mfr.; improvement to piano, 6-194.

Broddingnag, island in *Gulliver's Travels*. Inhabited by giants, 7-208.

Brocade. Cloth, 2-419.

Broccoli, 2-151.

Brooke, Sir Thomas (1847-1922). Notable Brit. sculptor; among his works is the Queen Victoria Memorial in front of Buckingham Palace.

Brook. Old English name for the badger.

Brocken. Mt. of Harz mts., Ger., 3,750 ft.; superstitions, 4-135.

Brocket. S. Amer. deer, 3-60.

Broderie Anglaise, type of embroidery, 3-239.

Brogie (brôî), Prince Louis de (b. 1892). Fr. physicist; author of wave mechanics theory, 6-318; Nobel prize for physics (1929), and electron microscope, 5-197.

Brogues, Irish, type of shoe, 2-14 illus.

Broken Hill, Australia, mining tn. in W. of New South Wales: pop. 26,500, 5-402.

Broken Hill, N. Rhodesia: mines, 6-394.

Broker. One who buys or sells on behalf of another. See also Stock Exchange terms.

Bromberg. Ger. name for the Polish city Bydgoszcz (q.v.).

Bromethol, an anaesthetic, 1-143.

Bromide, a compound of bromine; as antidote to strychnine, 6-236; as sedative, 4-121.

Bromine (Br), a non-metallic liquid element of the halogen group; atomic weight, 79.9; used in the manufacture of coal-tar dyes, freezers at 19° F.; 3-224, 4-120; the name is derived from the Greek *bromos*, a stench.

Bromley. Tn. in Kent; pop. 64,178 5-27.

Brompton Oratory, London, s.w., built in the style of the Italian Renaissance; so called because it is served by priests of the order of the Oratory of St. Philip Neri; a statue of Cardinal Newman faces the building.

Bronchi. The two main branches of the trachea (windpipe), 5-51, 7-404 illus.

Bronchial tubes, of lungs, 5-51.

Bronchitis. Disease of the lungs, 5-52.

Broncho-pneumonia. Disease of the lungs, 5-52.

Bronstein, David. Russ. chess champion, played drawn game with Mikhail Botvinnik, world champion in 1951, 2-328.

Bronstein, Lev Davidovich. See Trotsky, Leon.

Brontës, The. Eng. literary family, who lived at Haworth Parsonage, Yorks., 2-91; Anne Brontë (1820-49), 2-91, 92; Charlotte Brontë (1816-55), 2-91, 5-472; Emily Brontë (1818-48), 2-91, 5-472; Patrick Branwell Brontë (1817-48), 2-91.

Brontosaurus, prehistoric animal 6-281.

Bronx, The. One of the five boroughs of New York City, 5-410, 412.

Bronze. Alloy of copper and tin, 2-92, 1-114; Jap. bronze work, 4-351.

Bronze Age, period in history characterized by use of bronze, 2-92, 5-109, in Britain, 2-73.

Brooch. Article of jewelry, 4-372 with illus.

Brooke, Sir Basil. See Brookeborough, Viscount.

Brooke, Sir Charles A. J. (1829-1917). Rajah of Sarawak 1868-1917. During his rule Sarawak territory was increased and became a Brit. protectorate, 6-199.

Brooke, Sir Charles Vyner (b. 1874). Rajah of Sarawak 1917-46, 6-199.

Brooke, Sir James (1803-68) Rajah of Sarawak, Borneo; wealthy retired Eng. soldier; suppressed piracy and head-hunting and introduced civilization; 2-19, 6-498, with portrait.

Brooke, Rupert Chawner (1887-1915). Eng. poet, 2-93.

Brooke, Stopford Augustus (1832-1916). Brit. preacher and author; appointed chaplain to Queen Victoria (1872); became Disenting minister (1880); (*Primer of Eng. Literature: History of Early Eng. Literature*).

Brookeborough, Basil S. Brooke, Viscount (b. 1888). Prime min. of N. Ireland from 1943.

Brookes, Norman Everard (b. 1878). Australian tennis player, 4-462.

Brooklands. Former motor racing track near Weybridge, Surrey.

Brooklime (plant). See under Speedwell.

Brooklyn. One of the five boroughs of New York City, U.S.A., 5-410, 412.

Brooks's Club. London club, first in Pall Mall, then in St. James's Street; founded 1764 by Almack, 1-117.

BRUCKNER

Broom. Shrub of the pea family, emblem of the Plantagenets.

Broom, Leoh, Row and Cromarty, Scot., 6-455.

Broomrape. Parasitic plant, 5-444.

Brough, Aitha Louise (b. 1823). Amer. tennis player. Winner of women's singles at Wimbledon in 1948, '49, '50 and '51, 4-462.

Brougham (brô'm or brôm). Henry, Baron (1778-1868). Brit. lord chancellor and Liberal reforming statesman; counsel for Queen Caroline in defence against divorce from George IV; his unique private carriage was forerunner of the brougham.

Brouwer, Adriaen (c. 1606-38). Dutch painter, 5-382.

Brown, Sir Arthur Whitten (1888-1948). Eng. airman; knighted with J. Alcock, for first aeroplane flight across the Atlantic in June 1919.

Brown, Ford Madox (1821-93). Eng. painter; realistic treatment of historical subjects; inspired Pre-Raphaelite movement; "The Last of England," 3-264 illus.

Brown, John (1810-52). Scot. physician and writer (*Rob. and His Friends*; *Pal. Marjorie*); little masterpieces of keen, kindly, humorous character drawing.

Brown John (1526-83). Scot. glie, for 31 years the personal servant of Queen Victoria.

Brown, John (1800-59). U.S. anti-slavery agitator, 2-93.

Brown, Lancelot (1715-83). Eng. landscape gardener, called "Capability" Brown 2-94.

Brown, Thomas Alexander. See Boldrewood, Roll.

Brown Argus butterfly, 2-141 illus.

Brown bear, European, 1-392.

Brown Bess musket, 3-359, 358 illus.

Brown coal. See Lignite.

Browne, Robert (c. 1550-1633). Eng. Puritan divine, founder of the Brownists, the original Congregationalists, 3-163.

Browne, Sir Thomas (1605-82). Eng. physician and author; unrivalled master of stately rhythmic, but highly artificial and learned prose style (*Religio Medici*; *Uran-Burrah*) 3-286.

Brown Hairstreak butterfly, 2-141 illus.

Brown hyena, 4-223.

Brownie. In Scot. folklore, good natured goblin who milks cows, sweeps floors, and does other household drudgery for the family to which he attaches himself.

Brownies. Branch of Girl Guides 4-22.

Browning, Elizabeth Barrett (1806-61). Eng. poet, wife of R. Browning 2-94.

Browning, Lt.-Gen. Sir Frederick A. M. (b. 1890). Brit. soldier; deputy commander of Allied Airborne Army (1941) at time of airborne invasion of Netherlands. See Arnhem.

Browning, Robert (1812-89). Eng. poet, 2-95, 3-290.

Browning machine-gun, 5-64.

Brown rat, species of rat, 6-365.

Brownshirts (Nazis). See Storm Troops.

Bruce, Charles Granville (1866-1949). son of 1st Lord Aberdare; leader of Mt. Everest expeditions of 1922 and 1924, 3-321.

Bruce, Sir David (1855-1931). Brit. scientist, famous for researches into tropical diseases, esp. Malaria fever and sleeping sickness, 5-265.

Bruce, James (1730-94). Scot. explorer in Africa, 1-7, 1-54.

Bruce, Robert (1274-1329). King of Scotland, 2-90; at Bannockburn 6-512, 1-365; parliament at Ayr 1-330; Scotland's independence secured, 7-416.

Bruch (brô'kh), Max (1838-1920), Ger. violinist and composer (*Köl. Aides* and four concertos).

Brucine (brô'sin). An alkaloid found with strychnine in nux vomica and false angustura bark.

Bruckner, Anton (1824-96). Austrian composer; nine symphonies, a Mass, Te Deum; strong religious feeling.

BRUECHEL

Brueghel, [bréghel] Jan (1568-1625). Son of Pieter Brueghel the Elder, Flemish painter, nicknamed "Velvet"; and Rubens, 2-97.

Brueghel, Pieter (d. 1569). Flemish painter, 2-97, 5-381, 1-95 illus.

Brueghel, Pieter, the Younger (1564-1637). Nicknamed "Hell" Brueghel. Celebrated painter, 2-97.

Bruges. Old Flemish tn. of Belgium; pop. 52,561, 2-97 1-417; architecture, 1-420; open-air market, 1-422 illus.

Bruges lace, 4-431 illus.

Brugnon, Jacques (b. 1895). Fr. tennis player; won doubles championships with Cochet and Borotra, 4-462.

Brussels, first aid for, 3-368.

Brumas. Polar bear born at London Zoo, 1949, 1-391 illus.

Brumbies. Wild horses of Australia, 4-197.

Brumell, George Bryan (1778-1840). "Beau Brummell," Eng. dandy, dictator of fashion, early friend of Prince of Wales (King George IV).

Brunei. State of Borneo, on N.W. coast; area 2,226 sq. m.; pop. 40,000; Brit. protectorate, 2-19.

Brunei, Isambard Kingdom (1806-59). Brit. engineer, 2-98; Clifton suspension bridge, 2-72 illus.; and 7 ft. fly. gauge, 6-356; Saltash bridge, 2-61; and Thames tunnel, 7-325.

Brunei, Sir Marc Isambard (1760-1849). Anglo-French engineer, 2-98; and tunnelling "shield," 7-325.

Brunelleschi [brōnēleschi], **Filippo** (1377-1410). It. architect, called founder of Renaissance architecture; 3-392.

Brunetiere [brūntiär], **Ferdinand** (1819-1906). Fr. critic, editor of the *Revue des Deux Mondes*.

Bruneval [brūnval]. Fr. village 12 m. N. of Le Havre; Ger. radar centre here demolished by Brit. combined ops. attack, Feb. 27, 28, 1942.

Brunhild. Icelandic princess of great beauty and strength, in Song of the Nibelungs, 5-429.

Brunhilde (d. A.D. 613), queen of Austrasia, daughter of Athanagild, king of the Visigoths.

Bruning, Heinrich (b. 1885). Ger. statesman; Chancellor 1930-32.

Brunn. Ger. name for Czech city of Brno (q.v.).

Brunner, Sir John Tomlinson, Bart. (1842-1919). Brit. industrialist; with Ludwig Mond founded alkali works at Northwich in 1873.

Bruno, St. (c. 1030-1101). Founder of the Carthusian order of monks, of which the first monastery was at Chartreuse, nr. Grenoble.

Brunswick. Part of the *Land of Lower Saxony*, w. Germany, former duchy and state of N.W. Ger.

Brusa (Turkey). See Bursa.

Brush, Charles Francis (1849-1929). Amer. inventor; invented type of dynamo; developed arc light.

Brush. In electrical engineering a conductor arranged to make electrical contact between a stationary and a moving surface. On an electric motor the brush conducts power to the armature; on a generator it conducts power from the armature to the machine driven; on dynamo, 3-143.

Brushes, nylon, 5-488.

Brush turkey, hatching of eggs, 3-172.

Brusilov [brōsīlof], **Alexei** (1856-1926). Rus. general; brilliant successes in Galicia 1914-15 and 1916; accepted Bolshevik régime after 1917.

Brussels. Cap. of Belgium; pop. 964,749, 2-96, 1-417; architecture, 1-420; German occupation in 1940, 7-187.

Brussels carpet, 2-249.

Brussels sprouts. Small sprouts, each a miniature cabbage, springing from a certain species of cabbage, 2-151, 2-101.

Brut (c. 1205). Long poem by Layamon telling mythical story of Brutus, earliest of Eng. kings, 3-284.

Brutus, Lucius Junius. With Collatinus, first joint consul of Roman republic, 509 B.C., 2-101, 6-429.

Brutus, Marcus Junius (85-42 B.C.). Roman statesman, a slayer of Julius Caesar, 2-101, 2-163, 1-309.

Brutus the Trojan. Mythical first king of Brit., grandson of Aeneas, the son of Aeneas.

Bruxelles. See Brussels.

Bryant, Sir Arthur W. M. (b. 1899). Brit. historian; *Charles II, Peeps, The Years of Endurance, The Story of England*. Knighted, 1954.

Bryant, William Cullen (1794-1878). America's first great poet ("Thanatopsis"), 7-384.

Bryce, James Bryce, Viscount (1838-1922). Brit. statesman and historian, ambassador to U.S.A. (*The Holy Roman Empire; The American Commonwealth* a classic; *Modern Democracies; A Study of American History*).

Bryher. One of the Scilly Isles, 6-509.

Brynmawr. Mining tn. Breconshire, S. Wales; pop. 6,524 (1951), 2-55.

Bryonia, white: *Bryonia dioica*, fam. *Cucurbitaceae*; climbs by tendrils; flowers greenish-white, berries red; leaves lobed and hairy; black bryony *Tamus*, fam. *Moraceae*, also a climbing plant, has simple, heart-shaped, shiny leaves, and is not related to white bryony.

Bryophyta. Group of plants including liverworts and mosses, 2-24, 5-273, 6-214.

Bryozoa [brī'ōzōa]. Name given by Ehrenberg to a class of molluscoid animals, called moss animals.

Brythonic language. Ancestor of Welsh; spoken by Iron Age people, 2-73.

Bryum. Genus of mosses.

Bubbles. Painting by Sir John Millais; as soap advert., 5-208.

Bubonic plague. Epidemic disease, causing swollen glands, fever, and rapid death (the Black Death), 1-478; carried by rats, 6-365.

Buccaneers. Piratical adventurers (chiefly Eng. and Fr.) who in 17th cent. plundered Spaniards along coasts of W. Indies and S. Amer.

Buccina. Long brass trumpet used by Romans, 5-302.

Bucephalus. Horse of Alexander the Great, 2-102.

Buchan, Alexander (1829-1907). Scot. meteorologist. Popularly remembered for his "cold and warm" spells which interrupt, though not consistently, seasonal movements in temperature. He inferred them from study of Scottish records.

Buchan, John, 1st Baron Tweedsmuir (1875-1940). Scot. author and administrator, 2-102.

Buchanan, Robert Williams (1841-1901). Scot. poet, novelist, and playwright. Criticized aesthetical poets as "Fleashy School of Poetry."

Bucharest. Cap. of Rumania; pop. 984,619, 2-102.

Bucharest, Treaties of, 2-102.

Buchenwald [boōk'envalt]. Ger. concentration camp near Weimar, Thuringia; overrun by U.S. forces April 12, 1945.

Buchman, Frank Nathan Daniel (b. 1878). American evangelist. Founder of the Group and Moral Re-Armament Movements.

Buck. See Stag.

Buck, Pearl (b. 1892). Amer. novelist. (*The Good Earth, The Patriot*). Awarded Nobel prize 1938, 7-366.

Bucket excavator, 3-325.

Bucket shop. See Stock Exchange Terms (table).

Buckfast Abbey, Devon, Eng., 1-3, 3-82.

Buckingham, Duke of. Eng. title held by four families, 2-103.

Buckingham, George Villiers, 1st Duke of (1592-1628). Eng. courtier, 2-103; and Charles I., 2-306.

Buckingham, George Villiers, 2nd Duke of (1628-87), 2-103.

Buckingham, Former co. tn. of Bucks, Eng.; pop. 3,944, 2-105.

Buckingham Palace. Royal palace, London, 2-104.

Buckinghamshire. Co. of Eng.; area 749 sq. m.; pop. 386,164, 2-106.

BUILT H WELLS

Buckle, Henry Thomas (1821-92). Eng. historian (*History of Civilization in England*), 3-291.

Buckthorn. Flowering shrub of genus *Rhamnus*; alder buckthorn, thornless, 5 ft. to 10 ft., has broad leaves on which brimstone butterfly caterpillars feed; purging buckthorn, taller, is thorned at branch ends. Sea buckthorn, no relation, found on E. coast of England.

Buckwheat. Cereal crop of N. Amer.; grain used for poultry and buckwheat cakes.

Bucolles [būkol'iks] or *Ecolgues* (from Gk. word for "cowherd"). Pastoral poems of Gk. and Rom. poets, partic. Virgil, 7-102.

Budapest. Cap. of Hungary; pop. 1,600,000, 2-105, 3-48, 4-205, 4-207 illus.

Buddha [bood'a] (c. 560-440 B.C.). Hindu prince Siddhartha Gautama (or Gotama); founder of Buddhism, 2-106, 1-445, 4-251.

Buddh Gaya. Vill. of Bihar, India; traditional resting place of the Buddha and a famous pilgrimage centre.

Buddhism, 2-107; in China, 2-366; in Japan, 4-314; sanctity of cobra, 2-136; and art, 4-352.

Budding, in gardening, 3-504.

Budenny [boōdyon'i], **Simeon Mikhailovich** (b. 1876). Russian soldier; as cavalry gen. defeated Denikin's White Army, 1920; prominent in defeating Finns in 1940; pursuing "scorched earth" policy, blew up the Dnieper Dam, Aug. 1941.

Budge (John) Donald (b. 1916). Amer. tennis player; won singles at Wimbledon in 1937 and 1938.

Budgerigar. Australian long-tailed grass parakeet, 6-92 with illus.

Budget. Name given to the annual statement of the country's finances made by the chancellor of the exchequer in the House of Commons, 7-231.

Buenaventura [bwānavent'ōra]. Port of Colombia on Pacific at mouth of Dagua; destroyed by fire in 1931 but since rebuilt; important trade centre; pop. 30,000.

Buenos Aires. Cap. of Argentina; pop. 3,000,000, 2-108.

Buffalo. City of New York state, U.S.A.; engineering works and meat-packing plants; pop. 580,132.

Buffalo. Animal of the ox family, 2-109; milk from, 5-205. See also Bison.

Buffalo Bill (1845-1917). An American scout and showman (William Frederick Cody), 2-109.

Buffalo bird, 2-109.

Buffalo wolf. See Grey wolf.

Buffer, of locomotive, 5-4.

Buffer states. Areas strategically or economically important, whose independence is sanctioned by great powers as checks or "buffers" on rival nations.

Buffon, Georges Louis Leclerc, Comte (1707-88). Fr. naturalist, 2-110.

Buff Orpington. Breed of poultry, 6-277 illus f.

Bug. Two rivers of Europe; one, also called Western Don, rises in Poland, flows N. 440 m. into Vistula at Novo Georgievsk; the other, in S.W. Ukraine, flows about 450 m. to Black Sea.

Bug Bible. The (1551), reason for name, 1-443.

Buggy. In Gt. Brit., a light two-wheeled vehicle drawn by one horse. In U.S. usually has four wheels.

Building Construction, 2-111; modern architecture and materials, 1-219; arch., 1-201; brick-making, 2-57; concrete, 2-476 with diag.; glass in, 4-31; as a career, 2-234. See also Architecture.

Building Societies. Companies lending money on mortgage to house-purchasers.

Building Terms. See Architecture Terms (table).

Builth Wells. Tn. and health resort in Breconshire, Wales; pop. 1,708, 2-55.

BUKOVINA

Bukovina [bʊkəvɪˈna]. Humana; former region of Austria; 4,030 sq. m.; pop. 800,000; N. Bukovina annexed by Soviet Union, Aug. 1940.

Bulawayo, S. Rhodesia; pop. 93,000; gold-mining centre, 6-395.

Bulb, of plants, 2-118; food stores, 4-470; Dutch flowers, 5-374, 375 illus.

Bulbul, Arabic-Persian name of thrush-like birds native to Africa. Asia Minor, India. Up to 10 in. long. Plumage brown or green.

Bulgarian, Nikolai Alexandrovich (b. 1895). Prime minister of the U.S.S.R. from 1955. Born Nizhni-Novgorod (now Gorki). Interested in industrial and financial subjects; organized civilian defence of Moscow 1911; became a vice-premier 1946; min. of defence, 1953; succeeded Malenkov as premier, 1955.

Bulgaria, Balkan state; area 42,796 sq. m.; pop. 7,000,000. Cap. Sofia, pop. 440,000, 2-119; origin of people, 1-350; and Macedonia, 5-83; relations with Italy, 2-191; independence, 7-335; roses for perfume, 6-123; flag, 3-384 illus f.

Bull, Dr. John (1562-1628). Eng. composer; and tune of Brit. national anthem, 4-378, 5-325.

Bull, Ole (1810-1880). Norwegian musician; founded first Norwegian theatre at Bergen in 1850, 5-467.

Bull, See Cattle.

Bull, See Stock Exchange Terms (table).

Bull (constellation). See Taurus.

Bullace, a wild plum, 6-228.

Bulldog. See Dog, 3-100 illus f.

Bullen, Frank Thomas (1857-1915). Eng. writer of sea stories (*The Cruise of the Cachalot*; *Sea Wreck*).

Buller, Sir Redvers Henry (1830-1908). Brit. general; commander of Brit. forces in early part of Boer War; relieved Ladysmith after several reverses; superseded by Lord Roberts.

Bullet-proof vests, in modern armour, 1-244.

Bullets, 3-359, 4-463.

Bull-fighter, 2-121; origin of, 7-105; in anc. Crete, 1-24 illus.; in Portugal, 6-267.

Bullfinch. Songbird of the finch family, 2-123; egg, 1-452 illus. f.

Bull frog. Species of frog native to N. Amer. Makes a great noise for its size, hence the name. Length up to 10 in.

Bull Run, battle of (1861). First battle of American Civil War, 4-333; victory of Gen. Lee, 4-475.

Bull terrier. Breed derived from a cross between a bulldog and a pointer, Dalmatian, or terrier, 3-100 illus. f.

Bully, in hockey, 4-181.

Bülau (bölöf), Bernard von, Prince (1849-1929). Ger. statesman and diplomat, chancellor 1900-09.

Bülau, Hans Guido von (1830-91). Ger. pianist and conductor, one of the greatest of his time.

Bulrush. Marsh and water plant, 2-123.

Bumble-bee. See Humble-bee.

Buna. Synthetic rubber; first made from butadiene and sodium (soda).

Bunbury, Spt. of W. Australia, on Koombah Bay; pop. 8,700.

Bunche, Dr. Ralph (b. 1901). Amer. Negro professor; as U.N. representative persuaded Israel to sign armistices with Arab neighbours, 4-303.

Bund, The. Famous street along the riverfront at Shanghai, 7-16 illus.

Bundesrat (boon deersht), federal council of the former Ger. empire; replaced in 1918 by the Reichsrat; name revived for upper house of Fed. Ger. Rep., Sept. 1949.

Bundestag. Name given to lower house of Fed. Ger. Rep., Sept. 1949.

Bunker, in golf, 4-46.

Bunker. See Nautical Terms (table).

Bunker Hill, battle of, 1775, first battle of War of Amer. Independence, 1-138.

Bunkum. Origin of term, 2-124.

Bunsen, Robert Wilhelm Eberhard (1811-99). Ger. chemist; invented Bunsen burner, 2-124; work on geyser, 4-16.

Bunsen burner, Gas-air burner, 2-124 with illus.

Bunt, form of smut fungus.

Bunting. Group of birds related to the finch family 2-124.

Bunyan, John 1628-88). Eng. Puritan leader, and author of *The Pilgrim's Progress* (1677 and 1684). 2-125 3-287; compared with Milton 2-128.

Buonaparte (family). See Bonaparte.

Buoy. A navigation aid, 2-128; acetylene light buoys, 1 10.

Buraida. Tn. in Saudi Arabia; pop. 30,000, 1-190.

Buran, a high north wind with snow, in Siberia 7-459.

Burbage, James (d. 1597). Eng. actor manager and Shoreditch theatre 3-118.

Burbage, Richard (c. 1567-1619). Eng. actor, famous for impersonation of Shakespearean characters; associated with Shakspeare.

Burdekin, R. of Queensland, rises on E. slope of Great Dividing Range and flows 350 m. into Pacific, 6-322.

Burdett-Coutts (bɜːldetkɒts), Angela Georgina, Baroness (1814-1906) Eng. philanthropist.

Burdigala (Rom town) See Bordeaux.

Burdock. Potentilla plant, family Compositae; common by roadsides in Gt. Brit., seeds, 6-529 illus.

Bure, R. in Norfolk flowing into the Yare 50 m. long.

Burgas. Tn. in Bulgaria, pop. 44,000, 2-119.

Burgesses, House of. The first Amer. representative legislative body, called in Virginia in 1619, name continued until time of War of Independence.

Burgh (bɜːr). Scot. form of the Eng. word borough; a burgh which received its charter from a king is called a royal burgh (41 in 1951).

Burghley, David George Brownlow Cecil, Lord (b. 1905). Eng. athlete; famous hurdler, 2-285.

Burghley, William Cecil, Lord (1520-98). Eng. statesman, for 40 yrs. chief adviser to Queen Elizabeth I, 2-284.

Burglar alarm, photo-electric cell, 6-162, 163 illus.

Burgos (bɜːrɡos). City of Spain, 7-103; cathedral, 7-113 illus.

Burgoyne (bɜːɡoln), John (1722-92). Eng. general in War of Amer. Independence; northern campaign and defeat at Saratoga, 1-139.

Burgundy (bɜːɡʊndi). Former king dom and duchy in E. cent. France, now included in 4 depts.

Burgundy wine, 3-436.

Burgundy, Fritillary, butterfly, 2-141 illus.

Burial customs, in anc. Egypt, 3-183, 3-192 illus.; among pygmies, 4-110.

Buriat Mongol Region, autonomous Asiatic republic of U.S.S.R.; pop. 542,000; cap. Ulan-Ude.

Buriats, Mongol people, 5-239.

Burin Engraving tool, 3-292 with illus.

Burke Edmund (1729-97). Brit. statesman, 2-129, 3-258. In Pitt, 6-208.

Burleigh, Lord. See Burghley, Lord.

Burlington House, London; and Royal Academy, 1-9.

Burma. Republic of Asia, area 262,000 sq. m.; pop. 17,750,000; cap. Rangoon, 2-130, 2-84; flag, 3-385 illus. f.; in 2nd World War 7-491, 492 illus., 496, 498.

Burma Road. Highway from Lashio, Burma, to Chungking on the Yangtze built by Chinese native labour in 1939; in 2nd World War cut by Japs., 1942-45. See Lashio Road.

Burma-Siam Rly. So-called "Death Railway," 282 m. long, built by forced labour of Brit. and Allied prisoners in Jap. hands Oct. 1942-Nov. 1943; of 64,000 whites, over 13,000 died; connects rly. lines through Bangkok and Moulmein.

Burma tar. Medal for service in Burma campaign from Dec. 11, 1911.

Burmese Wars. Fought between the Brit. and the Burmese; first war, 1824-6, second, 1852; third, 1885-6; in the last of these King Theebaw was made prisoner.

BUSBY

Burnand Sir Francis Cowley (1836-1917). Eng. journalist, who was editor of *Punch* for about 25 years; author of many stage burlesques (*Black-and-White*).

Burne-Jones, Sir Edward (1833-98). Eng. painter noted for highly decorative design, 3-264; and Pre Raphaelites, 6-285; and William Morris 5-206.

Burnet rose, flower, 6-453.

Burnett, Frances Hodgson (1819-1924). Amer. novelist, born in England. (*Little Lord Fauntleroy*; *The Secret Garden*; *A Lady of Quality*).

Burney, Sir Charles Dennistoun (b. 1888). Brit. sailor, designed R100 airship, 94; invented paravane device for severing mooring-lines of sea-mines.

Burney, Fanny (Frances) (1752-1840), also known by her married name Minc. D'Arbly. Eng. novelist; her first novel *Evelina* (1778) made her famous; diary, 3-46.

Burnham, Edward Lawson, 1st Baron (1833-1916). Brit. journalist, son of Joseph Moses Levy, founder of *The Daily Telegraph*, of which he became managing proprietor and editor in 1855.

Burnham, Harry Lawson, 1st Viscount (1862-1933). Brit. journalist and politician, son of Baron Burnham, headed committee responsible for setting up "Burnham Scale" for teachers' salary.

Burnham-on-Crouch. Yachting centre on the Crouch estuary, Essex, herring-fishing, boat-building, oyster cultivation; pop. 3,962.

Burnhope Seat. Height in Durham Co. Eng.; 2,452 ft., 3-139.

Burning. See Combustion.

Burnley. Tn. in Lancashire, 22 m. S. of Manchester; pop. 81,950; cotton and worsted weaving iron mfrs. 4-441.

Burns, John (1758-1794). Early labour member of Brit. House of Commons (1802-1918); pres. Local Govt. Board 1903; 14 of Board of Trade 1914; opposed Brit. entrance into 1st World War and retired into private life; had a notable library.

Burns, Robert (1759-96). Scot. poet 2-132, 3-284, 6-514.

Burns and scalds first aid for 3-368.

Burnside, Ambrose Everett (1824-81). Amer. soldier; and "burnside whiskers", 1-398 illus.

Burrinjuk Dam, New South Wales-Australia, 4-218 illus.

Bursa, or Brusa, city of Turkey; pop. 80,000; silk manufactures.

Burslem. Famous pottery dist. in Staffordshire, part of city of Stoke-on-Trent; birthplace of Josiah Wedgwood 7-141.

Burton, Sir Richard Francis (1821-90). Eng. explorer and writer 2-133 travels in Arabia, 1-195; translation of the *Arabian Nights*, 1-196.

Burton, Robert (1577-1640). Eng. author (*The Anatomy of Melancholy*), curious fantastic book, beloved by Lamb and Samuel Johnson, 3-286.

Burton Bridge, Battle of, Edward II's victory, 2-133.

Burton-upon-Trent. Town in Staffordshire, pop. 49,169; seat of brewing industry, 2-133, 7-141.

Buru (bɜːru), Isl. of Molucca group, East Indies.

Bury, C. K. Howard (b. 1883). Leader of expedition to Everest (1921) 3-319.

Bury. Tn. in Lancashire. Eng. pop. 58,829, 4-444.

Bury St. Edmunds. Tn. in W. Suffolk, pop. 20,045, named from Saxon king Edmund, 2-133; 7-182.

Burying beetles, (family *Silphidae*), habits, 1-415.

Bus. Passenger transport vehicle, horse bus, 6-412; steam bus, 6-41; 412 illus.; motor bus, 6-414; trolley bus, 7-306; centre of gravity, 6-155 illus.

Busby Richard (1606-95). Eng. school master, head of Westminster School (1638-95); notorious for unparaphrase use of the birch.

BUSHEL

Bushel, a unit of measure. See **Weights and Measures**.

Bushman. Pygmy tribe of Kalahari desert, 6-312, 1-50; and early settlers, 7-90; as a khoisaniform, 6-335 illus.

Bushnell, David (1742-1824). American who invented a one-man submarine, 7-174.

Bush Vetch. Plant, leaves, 4 171 illus.

Bushy Park. Royal park in Middlesex; adjoins Hampton Court. Here was h.Q. of U.S. forces in U.K. during 2nd World War.

Business. See **Commerce**.

Busoni, Ferruccio Benvenuto (1866-1924). Ger.-It. pianist and composer.

Buss, Frances Mary (1827-94). With Dorothea Beale (q.v.), one of the pioneers of higher education for girls; a founder of the North London Collegiate School.

Bustamante, Sir Alexander (b. 1884). Jamaican politician, 4-338.

Bustle, in 19th cent. fashion, 2-421.

Butadiene. A hydrocarbon used in making artificial rubber. See **Buna**.

Butane. Colourless, inflammable gas with a faint colour, obtained from petroleum; formula, 2-319; 5 331.

Butcher, Samuel Henry (1850-1910). Brit. classical scholar; translated (with Andrew Lang) Homer's *Odyssey*.

Butcher bird. See **Shrike**.

Butcher's Broom. Small perennial, evergreen plant of lily family, remarkable for its "cladodes," leaf and flower stalks flattened to look like, and act as, leaves, the latter being absent. Flowers whitish minute; large red berries at Christmas-time.

Bute, John Stuart, 3rd Earl of (1713-92). Brit. statesman, supporter of royal autocracy; prime minister 1762-63.

Bute. One of the seven islands of the Shetlands, Scot., 2-131.

Buteshire. Western co. of Scot. consisting of seven islands in the Firth of Clyde; area 218 sq. m.; pop. 19,285. Co. tn. Rothesay (pop. 10,145) on island of Bute, 2 134.

Butler, Lady Elizabeth (1850-1933). Brit. painter famous for her battle pictures, e.g., "The Roll Call" thought by Queen Victoria.)

Butler, Joseph (1692-1752). Eng. bishop, philosopher and theologian (*Analogy of Religion*).

Butler, Nicholas Murray (1862-1947). Amer. educationist and politician; president of Columbia Univ., 1902-47; pres. of Pilgrims' Society 1928-46. Awarded Nobel peace prize with Jane Addams, 1931.

Butler, Richard Austen (b. 1902). Brit. Cons. politician; min. of education 1911-45 (Education Act, 1944); chairman of the exchequer 1951-55; Lord Privy Seal 1955.

Butler, Samuel (1612-80). Eng. poet; author of *Hudibras*, a satire on puritanism.

Butler, Samuel (1835-1902). Brit. satirical novelist and painter. Wrote on evolution, Homer, Shakespeare; *Kreuchon* and *Kreuchon Revisited* are the satires; autobiographical novel *The Way of All Flesh*. On memory, 5 168; influence on Shaw, 7-19.

Butlin, William E. (b. 1900). Brit. business man; in 1921 had one hoop-la stand at a fair; in 1936 opened holiday camp at Skegness, and later all round coast, accommodating 100,000 holiday makers.

Butt, Dame Clara (1873-1936). Brit. singer - first professional appearance in London, 1892; foremost contralto singer in the country.

Butt, or bend. Part of a hide used for sole leather, 4-467 with diag.

Butter. Fatty portion of milk or cream solidified by churning, 2-134; vitamins in, 5-124.

Butter and eggs (plant). See **Toadflax**.

Butterbur. Plant of order *Comp. stir*, producing enormous leaves and growing in damp places; flowers, which appear in March, before leaves, are very small, very numerous, purplish in colour.

Buttercup. A plant of crowfoot family, 2-135; parts of flower, 3-395.

Butter-fat, in milk, 5-205.

Butterflies and Moths. Insects of the order *Lepidoptera*, 2-136; collecting, 2-453; hibernation, 4-173; interference colours in wings, 2 463; pollination of flowers, 3-400; protective coloration, 6-298; tongue 7 291.

Butterfly fish. Tropical fish, 5-129 illus. f.

Buttermere. Lake in Cumberland; 1½ m. long, 4-439.

Buttermilk, in butter making, 2 135.

Butterwort. Plant which traps insects for food, 5-444, 6-218 illus.

Butt joint. See **Architectural Terms**.

Buttonholes, how to make, 7-7.

Buttons, 2 146; as jewelry, 4-372; from corozo nuts, 5-187; how to sew, 7-8.

Button's Coffee house, London. Historic meeting place of 18th cent. literary men, 1-15.

Buttress. See **Architectural Terms**.

Butyl alcohol, formula, 1 96.

Butylene. Gas; structure and formula, 2 319.

Butyric acid, produced by enzymes, 3 316.

Buxtehude, Dietrich (1637-1707). Dan. composer and organist; and Bach, 1-340.

Buxton. Tn. in the Peak Dist., Derbyshire; noted for its springs and natural hot baths; pop. 19,556. 3-76, 6 118.

Buyer, in commerce; as a career, 2-230, 231.

Byss-Ballot, Christoph (1817-90). Dutch meteorologist, discoverer of the law named after him that, in the N. hemisphere, a person with his back to the wind has lower pressure on his left and higher on his right hand, and the converse in the S. hemisphere.

Buzzard. Bird of prey, 2 146.

Buzzard's Bay, Massachusetts, U.S.A., 5-141.

By, Col. John (1781-1836). Brit. engineer; and settlement of Bytown (1827), Ottawa, 6 10.

Byalystok. Tn. in Poland on Byaly river; textiles, hats, grain and lumber; pop. (1938) 107,000.

Bydgoszcz [błdgószch], formerly Ger. Bromberg. Tn. of Poland; iron goods, locomotives, furniture, paper, on Vistula-Oder Canal; German 1772-1919; Polish 1919-39, when

captured by Ger.; re-taken by Russ., Jan. 1945; pop. 110,000.

By-laws, 4 53.

Byelorussia. See **White Russia**.

Byng, John (1704-57). Eng. vice-admiral, son of Admiral Byng, 1st Viscount Torrington; sent in 1756 to engage the Fr. off Minorca, his conduct was unsatisfactory and he was court-martialled and shot. Voltaire said satirically, that he was shot "pour encourager les autres."

Byng of Vimy, Julian Hedworth George, 1st Viscount (1862-1933). Brit. army commander in 1st World War; gov.-gen. of Canada (1921-26); chief commissioner of Metropolitan Police (1928-31).

Byrd, Richard Evelyn (b. 1888). U.S. explorer of Arctic and Antarctic regions, 2-147, 6 216, 247; flight over N. Pole, 1-42, 6 245.

Byrd, William (c. 1542-1623). Eng. musical composer; pupil of Tallis; organist of Chapel Royal, London.

Byrne, (Brian Oswald) Donn (1889-1928). Irish novelist, 4-287.

Byrne, Charles (1781-1783). Irish giant who measured 8 ft. 7 ins.; and John Hunter, 4 17, 208.

Byrnes, James Francis (b. 1879). U.S. jurist and statesman; went to Yalta conference with F. D. Roosevelt, Feb., 1945; Truman's first sec. of state, 1945; resigned Jan. 1917.

Byrom, John (1692-1763). Teacher of a shorthand system and writer of verses; hymns, 4 226.

Byron, George Gordon Noel, 6th Baron (1788-1824). Eng. poet, 2-147; 3 289; quotation, 4-170.

Byssus [bissus]. Name used formerly for a fine flax fibre and fabric; hence applied to the flax-like filaments of the mussel and other molluscs.

Bytownite. Greenish mineral resembling feldspar, so called from its having been first found at Bytown (Ottawa).





Byzantine Empire, 2-148, 4 77; as last bastion of Rom. empire, 5-199; Belsharius and invasion of Italy, 4 306; and Turks, 7 333; painting, 6-33; influence of Byzantine art in Russia, 6-171, architecture, 1-210.

Byzantium [bizantium]. Anc. Gk. city on shores of the Bosphorus, founded in 657 B.C., 2-148. See also **Istanbul**.

THE CHIEF RULERS OF THE BYZANTINE EMPIRE

395 408	Arcadius	912 958	Constantine VII, Porphyrogenitus
408 450	Theodosius II	958-963	Romanus II
450 457	Marcellianus	963-1025	Basil II, Bulgaroktonos
457 474	Leo I	1025 25	Constantine VIII
474 491	Zeno	1025 34	Romanus III, Argyrus
491 518	Anastasius I	1034 42	Michael IV, the Paphlagonian
518 527	Justinian I	1042 55	Constantine IX, Monomachus
527 565	Justinian I	1055 57	Theodora
565 578	Justinian II	1057 59	Isaac I, Comnenus
578 582	Tiberius II	1059 67	Constantine X, Duca
582 602	Mauricius	1067 78	Michael VII
602 610	Phocas	1078 81	Nicephorus III
610 642	Heraclius	1081-1118	Alexius I, Comnenus
642 668	Constant II	1118-43	John II, Comnenus
668 685	Constantine I	1143-80	Manuel I, Comnenus
685 695	Justinian II	1180-83	Alexius II, Comnenus
695 697	Leontius	1183 85	Andronicus I, Comnenus
697 705	Theodore III, Apsimarus	1185-95	Isaac II, Angelus
705 711	Justinian II (restored)	1195-1203	Alexius III, Angelus
711-713	Philip	1203-04	Isaac II (restored) jointly with Alexius IV
713-715	Anastasius II	1204	Alexius V
715 717	Theodosius III	1204-22	Theodore I, Lascaris
717-740	Leo III, the Isaurian	1222-54	John VII
740-775	Constantine V, Copronymus	1254-59	Theodore II
775 779	Leo IV	1259 82	Michael VIII, Palaeologus
779-797	Constantine VI	1282-1328	Andronicus II, Palaeologus
797 802	Irene	1328-41	Andronicus III, Palaeologus
802 811	Nicephorus I	1341-91	John V, Palaeologus
811-813	Michael I, Rhangabe	1391-1425	Manuel II
813-820	Leo V, the Armenian	1425-48	John VI
820 829	Michael II	1448-53	Constantine XI
829 842	Theophilus	(1453 Capture of Constantinople by Turks and fall of the Byzantine Empire)	
842-867	Michael III		
867-886	Basil I, the Macedonian		
886-912	Leo VI, the Wise		

C

IN the hieroglyphic writing of ancient Egypt C was a throne . In its simplified form it looked more like a camel with its hump . The Phoenicians and Hebrews called it *gimel*, which was their word for "camel," and wrote it . Among the Greeks *gimel* became *gamma*. By this time the camel had turned round and the hump had become a right angle, so that it looked like this: . Then gradually it became

transformed into the rounding letter C. Its sound was a hard *g* (as in "go"), but the Romans afterwards gave it the sound of *k*. In Anglo-Saxon or Old English, *c* had the sound of *k*, but it was gradually changed to *ch* before *e* and *i*. In the English of to-day it still has the sound of *k* before *a*, *o*, *u*, and before any consonant other than *h*. Before *e*, *i*, or *y* it has the sound of *s* or *sh*. Followed by *h* it has either the sound of *k* or a softer one, as in *chop*.

Cab. Horse-drawn or motor-driven vehicle licensed to carry passengers for profit. First cabs in Gt. Brit. were two-horsed hackney coaches, introduced in London, 1820, 6-412.

Cabal (kabal). Unpopular Eng. ministry (1867-73) under Charles II composed of Clifford, Ashley, Buckingham, Arlington, and Lauderdale, whose initials formed the word: see *Cabala* below.

Cabala, The. Mystical interpretation of Scriptures, 4-151.

Caballero, Francisco Largo (1869-1946). Spanish labour leader. Premier in Popular Front Ministry 1936-37; after Spanish Civil War settled in France; imprisoned in Dachau by Germans during 2nd World War; died in Paris.

Cabbage. Vegetable; cultivated varieties incl. cauliflower, broccoli, kales, 2-151; cooking of, 2-198.

Cabell, James Branch (b. 1879). Amer. writer, who made a reputation as a satirical novelist, 7-365.

Cabinet. In parliamentary govt., 2-151, 4-9; and Privy Council, 6-292.

Cabinet-making, as a career, 2-231.

Cable. In topography 2-152; cablese, 2-442; composition of, 2-155, 1-129; first Atlantic cable, 5-395; grid cables, 3-218; wire cable in bridge-building, 2-67; for telephony, 7-240.

Cable and Wireless Ltd. Brit. cable co., formed 1929, operating a great overseas and Empire network; U.K. assets taken over by Post Office in 1940, 2-155.

Cable-laid rope, 6-452.

Cable railway, 6-359.

Cabot, John (c. 1450-98). Genoese explorer, 2-156; voyage to Canada, 2-197; discovery of Newfoundland, 1-134, 5-395; and Bristol, 2-73.

Cabot, Sebastian (1474-1557). Son of John Cabot, with whom he sailed in 1497; expedition to S. Amer., 1-134, 1-225.

Cabral or Cabrera, Pedro Alvarez (c. 1460-1520). Port. navigator, bound to E. Indies, accidentally carried off course to Brazil (1500), 1-132, 2-19.

Cabrera, one of Balearic Isles, 1-349.

Cabrini, Maria Francesca (1850-1917). Italo-Amer. missionary and saint, known as Mother Cabrini; canonised 1946, the first Amer. saint.

Cacao (kakao). Tropical Amer. tree whose seeds yield chocolate and cocoa, 2-438, 439. See also *Cocoa* and *Chocolate*.

Cachalot or Sperm Whale. One of the largest members of the whale family, grows to 60 ft. long. The head yields up to 300 gallons of spermaceti, and blubber from the body sperm oil. Ambergris obtained from the intestines, 7-445, 446 illus.

Cactoblastus. Cactus-eating insect, 2-157.

Cactus. Leafless desert plant, 2-157; types of, 2-161, 162 illus. f., 5-336 illus.; modification of growth, 6-217; moisture conserving spines, 4-470 illus.; 3-319; and cochineal insect, 2-436.

Cadbury. Firm of Eng. cocoa and chocolate mfrs.; works at Bourneville, 1-473; cocoa powder, 2-439; as Quaker firm, 6-317.

Cadbury, George (1839-1922). Brit. business man and philanthropist of Quaker family; chief proprietor of the cocoa firm of Cadbury Brothers at Bourneville, where, with his brother Richard, he founded a model suburban town.

Caddis fly. Insect of order *Trichoptera*. Caddis grubs live on the bottom of streams and ponds, in cases made of pieces of stick, sand, or even tiny shells. In these they move about and pupate, finally emerging as 4-winged, moth-like creatures.

Cade, Jack (d. 1450). English rebel, 2-158, 4-103, 4-399.

Cadenos. See *Musical Terms* (table).

Cadenoy, marks of, in heraldry, 4-164 illus. f.

Cader Idris, Wales. Extensive mt. ridge in Merionethshire; Pen-y-gader, 2,927 ft., its highest peak, 5-174 illus., 175.

Cadet. Youth undergoing military training, or training for commission in armed forces. Armed forces, 2-158; in Royal Navy, 5-357.

Cadi. A judge in a Mahomedan court; in Algeria, 1-109.

Cadiz. Sp. spt. and naval station on Atlantic, 50 m. s.w. of Strait of Gibraltar; pop. 100,249; 7-104; founded by Phoenicians, 6-161; Drake's raid, 3-114.

Cadmium (Cd). A metallic element of the zinc group; atomic no. 48; atomic weight 112.41; used in the Weston standard electric cell; found in zinc ores and as greenockite; melts at 320.9° C.; named after cadmia, the Latin name for the zinc ore calamine, 3-224; in atomic pile, 1-301; in Wood's metal, 1-114.

Cadmus. In Gk. myth., brother of Europa, 3-122; mythical founder of anc. Thebes, 7-266.

Cadogan (kadi'gan), Sir Alexander (b. 1834). Brit. diplomat; perm. under-sec. of state for foreign affairs, 1938-46; perm. U.K. representative on U.N. Security Council, 1946-50. Awarded O.M. in 1951; chairman B.H.C., 1952.

Caduceus, staff carried by Mercury, 5-173.

Cadmon (kadmon) (d. c. 675). Earliest English Christian poet, 2-159, 1-442.

Caen. Tn. of Franco, cap. of Calvados dept.; pop. (1934) 67,851, 2-160; William the Conqueror and, 5-449.

Caerloun. Town in Monmouthshire, on R. Usk; as Isca Silurum, Rom. station; traditional site of Camelot, seat of King Arthur's court.

Caernarvon. Co. tn. of Caernarvonshire, Wales; pop. 9,255; castle, 2-260 illus.

Caernarvonshire. Co. of Wales; area 569 sq. m.; pop. 124,074, 2-160.

Caesar, Gaius Julius (102-44 B.C.). Rom. general, statesman and author, 2-161; 6-433; expeditions to Brit., 2-73, 3-275; and Brutus, 2-191; reforms calendar, 2-174; and Cleopatra, 2-407; foundation of Lille, 4-506; and Antipater, 4-375; and Pompey, 6-258; prose style, 4-450.

Caesar and Cleopatra (1898). Play by George Bernard Shaw; modern style dialogue, 7-19.

Caesarea (sazar'a) or **Caesarea Mazaca.** Anc. town in Asia Minor; cap. of kings of Cappadocia; destroyed by Persians A.D. 260; pop. then 400,000; modern town, Kaisariyeh.

Caesarea or Caesarea Palestina. Spt. in anc. Palestine on Mediterranean 5 m. n.w. of Jerusalem; built by Herod; modern village, Qisariya, has many Rom. ruins.

Caesarea Philippi. Anc. town in Palestine on E. Jordan at foot of Mt. Hermon; here Jesus gave his charge to Peter (Matt. xvi. 13).

Caesium [sē'sium] (Cs). Metallic element of the alkali metal group; atomic no. 55; atomic weight, 132.91 found in the rare mineral lepidolite; melts at 28.5° C.; 3-224, 1-112 named from the Latin *caesius*, bluish grey, owing to the colour it gives to a flame.

Caffeine. Alkaloid extracted from tea, coffee, or prepared synthetically from theobromine. Used as heart stimulant; in coffee, 2-114; 7-232, a nitrogen compound, 5-143.

Cage birds, canary, 2-207; in China 2-367 illus.

Cagliari (kah'lyahrē). It., cap. of Sardinia, on S. coast; pop. 111,571. Rom. amphitheatre, tombs, and other remains of antiquity, 6-199.

Cagliostro (kahlyōs'trō), **Alessandro** (1743-95). Assumed name of Giuseppe Balsamo, It. charlatan, implicated in the Diamond Necklace affair, 1-95.

Caiguards [kagū'ghar]. Fr. secret pro-fascist organization of the years before and during 2nd World War. So called from their custom of wearing hoods when they met, to hide their identities. Believed to be responsible for bomb outrages and murders, in Paris, 1937.

Calaphas (kaf'afas). Jewish high priest, before whom Jesus was arraigned before the crucifixion (Matt. xxvi. 3, 57); John xviii, 13-14, 21, 28; and who figured at the examination of Peter and John (Acts iv. 6).

Caicos Islands. Group of isls., geographically part of the Bahamas, but with the Turks Isls. form a dependency of Jamaica, 4-338.

Caillaux (kah'yo), **Joseph Marie Auguste** (1863-1944). Fr. premier 1911-12; imprisoned 1917-20; banished, 1920-25 for collaboration with the Germans; his wife in 1914 killed Gaston Calmette, editor of *Figaro*, for printing attacks on Caillaux.

Cain. Adam and Eve's first-born son, jealous slayer of his brother Abel (Gen. iv.).

Caine (Sir Thomas Henry) Hall (1833-1931). Brit. novelist, associated with Isle of Man. Stories melodramatic with strong religious tone (*The Manxman*; *The Christian*), 5-111.

Cainozoic era. In geology, latest main division, including Tertiary and Quaternary eras, 3-515, 516.

Cairn Braeriach. Highest point of the Grampian Range (4,248 ft.), 4-275.

Cairngorm. Range and peak (4,084 ft.) of Grampians, Scot.; gives name to a yellow or brown variety of quartz stones are used in Scot. for setting v.

CAIRNS

brooches, dirk-handles, etc., 1-361, 6-320. See also *Stones, Precious* (table).

Cairns. Spt. of Queensland, Australia; exports gold, copper, tin, silver, timber and coffee; pop. 15,000; 6-324.

Cairnmore of Garsphairn. Mt. in Kirkcudbrightshire, Scot., 2,612 ft., 4-115.

Cairnmore of Fleet. Mt. in Kirkcudbrightshire, Scot., 2,331 ft., 4-415.

Cairn Terrier. Small Scottish long-haired dog, 3-100 illus. f.

Cairo. Cap. of Egypt; pop. over 2,000,000, 2-163, 1-50; universities, 3-182, 5-89.

Caisson. Chamber of wood, concrete or metal, with water-tight walls, used in laying underwater foundations of quays, bridges, etc.; dry dock gates, 3-160; in Mulberry harbours, 5-290.

Calthness. Co. of Scot.; pop. 22,705; area 685 sq. m.; co. tn. Wick, pop. 17,161, 2-165.

Calus [kælz]. John (1510-73). Eng. physician; attended Edward VI, Mary I and Elizabeth I. In 1557 refounded Gonville Hall, Cambridge, as college of Gonville and Calus.

Cake. cooking of, 2-497.

Calabash. African gourd. The fruits are enclosed in a shell used by the natives for drinking cups and other domestic utensils.

Calabria [kal'brɪə]. Name, until 11th cent., of s.e. It. (the heel); now dept. in s.w. (the toe); a. 5,819 sq. m.; pop. 1,907,900; 4-304.

Caladium. Ornamental plant of S. Amer. with large "arrow-head" leaves and an- passage in stem.

Calais. Fr. spt. on Strait of Dover; pop. 50,018, 2-166; in Hundred Years' War, 4-204; lost to England 5-140; Ger. occupation 1940, 7-187.

Calamine. A zinc ore, a translucent brittle mineral, carbonate of zinc; also applied to a zinc silicate found associated with the carbonate (latter sometimes called smithsonite).

Calanus finmarchicus. microscopie sea animal, 1-450 illus.

Calcareous. Class of sponges with limy skeletons.

Calceolaria. Garden plant of the *Scrophulariaceae*, with yellow, red and brown bell-like flowers; named from Lat. *calceolus*, small shoe.

Calotte [kal'ɒt]. Calcium carbonate. Crystal refracts light doubly, so is used in Nicol prisms for the polarization of light; 3-1 illus.

Calcium and its compounds. 2-166. A white metallic element of the alkaline earth metal group. Chem. symbol Ca; atomic no. 20; atomic weight 40.08; 3-221; in bones and teeth, 3-109; parathyroid control of, 4-224; calcium carbide, 1-9; 2-166; calcium carbonate, 2-166; 4-508; calcium chloride, 2-166; calcium hydroxide, 4-508, 1-9, 1-112; calcium oxide, 4-508; calcium phosphate, 6-162, 5-177.

Calculating machine. 2-167, 1-238 with illus.

Calculi. Chalk-like stones sometimes formed in the kidneys, 4-403.

Calculus. in mathematics, 5-118; invented by Newton, 5-408.

Calcutta. Principal city of Western Bengal, India. Pop. (with Howrah) 1,000,000, 2-172, 1-365, 4-211.

Calcutta Cup. Trophy awarded to the winning country in the annual England v. Scotland International Rugby football match; presented by the Calcutta R.F.C. in 1879.

Calder Hall. First Brit. power station run on nuclear energy; nr. Sellafield, Cumberland, 1-302, 3-10.

Calderón [kalidə'ron] de la Barca, Pedro (1600-81). Span. dramatist, 7-122, 3-119.

Calche. Four-wheel horse-drawn carriage; still used in Quebec, 6-322.

Calendula. Name given by Romans to Scotland; now used poetically.

Calendonian Canal. Scot., 6-511, 4-275, 2-86.

Calendar. in reckoning time, 2-174; Antec., 1-332; almanacs, 1-117; reformed by Caesar, 2-163; Christian

calendar, 4-363; days of week, 3-55; Fr. Rev. calendar, 3-469; Mayan calendar column, 1-331 illus. f.; month, 5-255; New Year's Day, 5-409; Red Indian, 6-373 illus.

Calendar. in paper-making, 6-71.

Calendered rubber. process, 6-465.

Calendula officinalis. See *Marigold*.

Calif. Young of cattle, 2-274.

Calif. Type of leather, 4-469 illus.

Calgary. Alberta, Canada. Lending inland city of Canadian N.W.; pop. 129,060, 2-175.

Call. Colombia. Commercial centre in s.w. on branch of Cauca; pop. 140,000; rly. to Pacific port Buenaventura; 2-458 illus.

Callari. See *Veronese, Paolo*.

Caliban [kal'iban]. In Shakespeare's *Tempest*, deformed savage son of a witch and a devil, enslaved by Prospero.

Calibre. in measuring bore of artillery, 1-259; of rifles, 3-360.

Calico. Cloth, 2-419.

Calico printing. 2-420.

Calicut. Spt. on Malabar coast, Madras, India, 4-240, 5-70.

California. State of U.S.A.; area 158,693 sq. m.; pop. 10,586,223; cap. Sacramento, 2-177; Los Angeles, 5-38; gold rush of 1848, 4-39; basketry, 1-379; citrus oils, 6-123; introduction of *Synura* fig, 3-351; raisins, 6-361; ladybirds and pest fighting, 4-136.

California. Gulf of. Arm of Pacific Ocean 710 m. long between Lower California and mainland of Mexico.

California, Lower or Baja California. Peninsula of Mexico between Pacific and Gulf of California and Colorado r., 55,000 sq. m.; pop. 95,000.

Californian incense cedar. Tree; wood used for pencils, 6-113.

Californium (Cf). Chem. element; atomic no. 98; atomic weight 244; 3-221.

Calligula (A.D. 12-41). Gaius Caesar, Roman emperor 37-41, 2-178; madness, 6-137.

Caliper [kal'ipər]. Adjustable gauge for measuring small objects.

Caliph. Civil and religious head of a Mahomedan state. Title assumed by Selim I in 1517, abolished by Turks in 1924; 7-331, 336.

Calixtus II (d. 1121). Pope, concluded Concordat of Worms with Henry V (1122).

Calixtus III (1378-1458). Pope; in Borgia family, 2-17.

Calla lily. See *Arum lily*.

Callao [kalah'ə]. Chief port of Peru, 6 m. W. of Lima; pop. 87,587; excellent harbour; exports sugar, cotton, minerals, wool; 4-507, 6-138, 111.

Calligraphy. importance in Jap. art, 4-352.

Callimachus (c. 300-210 B.C.). Gk. poet; superintendent of library at Alexandria. Is said to have written more than 800 works, but only a few fragments are extant, 4-94.

Callimorpha dominula. Moth, 2-143 illus.

Calliope [kal'ipē]. In Gk. myth., Muse of epic poetry, 5-299.

Callisto. Nymph in Gk. myth.; story of, 2-489.

Call money. in finance, 1-1.

Calmar (Swed.). See *Kalmar*.

Calomel. Mercurous chloride, beneficial in liver complaints.

Caloric. A weightless fluid in old theory of heat, 4-145.

Calorie. Unit of quantity of heat. It is the amount of heat needed to raise the temperature of one gram of water to 1° C., 2-433; 4-148; the 15° calorie is defined as the amount of heat needed to raise the temperature of one gram of water from 14.5° C. to 15.5° C. The mean calorie is one-hundredth of the quantity of heat needed to raise the temperature of one gram of water from 0° C. to 100° C. The large calorie, or kilogram calorie, is equal to 1,000 calories, and is used as a measure of the energy values of foods, 3-410.

CAMDEN

Calotypes. Early kind of photographs made by Fox Talbot, 6-170.

Calpurnia. Last wife of Julius Caesar, who married her 59 B.C. She pleaded with him not to attend the senate (following a disturbing dream) on March 15, 44 B.C. She appears in Shakespeare's play *Julius Caesar*.

Calanissetta. City in Sicily; pop. 50,500.

Calumet. See *Pipe of Peace*.

Calvary. Hill outside Jerusalem, scene of the Crucifixion of Jesus, 4-367.

Calverley, Charles Stuart (1831-84). Eng. humorous poet and barrister (*Fly Leaves*).

Calvin, John (1509-64). Swiss theologian and reformer, 2-178, 2-380; at Geneva, 2-512; Huguenots and, 4-201; and the Reformation, 6-377.

Calydon. Ancient city of Actolia, Greece; scene of legendary hunt for the monstrous Calydonian bear which Artemis sent to ravage the country because she had been neglected in a sacrifice by the king of Calydon.

Calyppo. In the *Odyssey* a sea nymph with whom Odysseus lived for eight years, 5-501.

Calyppo. In W. Indies a ballad with words and refrain with a political or topical bias.

Cam. R. of Cambridgeshire, Eng., formerly called Granta. Length 40 m. Rises on s.w. border and flows n.w. and n.e. to join the Ouse 34 m. s. of Ely.

Cam (in mechanics). Projection on a wheel, or eccentric wheel, for turning circular into to-and fro movement; 4-271.

Camagney. Tn., Cuba; pop. 155,827; exports cattle products, 3-7.

Camalodunum. Rom. name of a city on site of modern Colchester. Stormed by Boadicea, A.D. 62.

Camargo, Marie (1710-1770). Fr. ballet dancer, first to dance in a skirt above the ankles, 1-351.

Camber. of road; suggested by A. Adam, 5-57; in aeronautics see *Aeronautical Terms*.

Camberley. Dist. in Surrey. It is the seat of the Staff College for training staff officers for the British army. Near here is Sandhurst, the Royal Military Academy.

Cambert, Robert (c. 1629-77). Fr. composer; and early Fr. opera, 3-514.

Camberwell. Met. bor. of s. London. Camberwell Green once celebrated for fairs. Pop. 179,729, 5-27.

Camberwell Beauty butterfly. 2-140 illus.

Cambium. Growing layer of cells between bark and wood of trees, etc., 7-308.

Cambodia. Kingdom of Indo-China, and state of the Fr. Union; area 70,000 sq. m.; pop. 3,750,000; cap. Phnom Penh, 2-179, 4-256, 1-274; map, 4-257; people, 4-257.

Camborne. Mining tn. in Cornwall, Eng.; pop. (with Redruth) 35,829, 2-508.

Cambrai [kalm'brɪ]. Fr. city; pop. (1946) 26,130; linen goods, especially cambric, to which it gave name; and 1st W. War, 7-181.

Cambrai, League of (1508), 7-388.

Cambrian period. in geology, 3-515, 516.

Cambric. A fine linen fabric; also cotton cloth made to imitate linen.

Cambridge. City and co. tn. of Cambridgeshire, Eng.; pop. 81,463; seat of Cambridge Univ., 2-181, 7-368.

Cambridge, Massachusetts. U.S.A.; pop. 120,740; seat of Harvard Univ.; 2-182, 4-134, 5-145.

Cambridgeshire. Co. of England; area 864 sq. m.; pop. 255,901; co. tn. Cambridge, 2-182.

Cambyses [kamblɪsɪz]. King of Persia (529-522 B.C.), son of Cyrus the Gr.; conquest of Egypt, 6-129.

Camden, William (1551-1623). Eng. antiquary and historian; wrote *Britannia*, a Latin survey of Gt. Brit. (1586) and *Annales*, a Latin hist. of reign of Q. Elizabeth I, 4-449.

CAMEL

Camel. Cud-chewing mammal, 2-183; Bactrian, 7-525 illus.; foot, 2-413 illus.; milk from, 5-205; ostrich compared with, 6-8; stomach, 6-171; Arabs riding, 1-194 illus.

Camellia. Shrub, 2-189.

Camelopard. Old name for giraffe, 2-22.

Camelot. Legendary seat of King Arthur's court, 1-256.

Camembert. Type of cheese made nr. village of Camembert, Normandy. Should be half liquid at the centre, 2-314.

Cameo. Engraved gem, 2-189.

Camera. Device for taking photographs; types of, 6-171; moving-picture camera, 2-393; sound camera, 2-391; crane camera, 2-389 illus.; underwater, 5-495 illus.; and eye compared, 3-331 with diag.; lens, 4-481 illus., 5-522 illus.

Camera lucida. 2-189.

Camera obscura. 2-189; as forerunner of camera, 6-170.

Camerae. Group of 16th cent. It. musicians and men of letters who had great influence on music 5-513.

Cameron, Basil (b. 1885). Brit. orchestral conductor; promenade concerts, 1942-44, with Sir Henry Wood; from 1945 with Sir Adrian Boult.

Cameron, Sir David Young (1865-1915). Scot. artist, 3-263.

Cameron, George Frederick (1834-85). Canadian writer, 2-203.

Cameron, Mt. In the Cameroons; ht. 13,350 ft., 2-190.

Cameroons. District of West Africa; British U.N. trusteeship 31,081 sq. m.; pop. 1,032,700; French U.N. trusteeship: 166,489 sq. m.; pop. 3,006,162, 2-189.

Camm, Sir Sydney (b. 1893). Brit. air craft designer; Hurricane fighter, 2-78.

Camões, Luis de (1524-80). Port poet, developed lyric poetry and greatly influenced national drama, 6-268.

Camomile. Plant, 2-190.

Camorra. It. secret organization for robbery, blackmail, etc. Flourished in Naples 16th-19th cent.

Camouflage. 2-190.

Campagna [kahmpah'nyal] di Roma. Plain around Rome, once malarial owing to Tiber floods and marshes; now largely reclaimed; 4-304.

Campanella, Tommaso (1568-1639). Dominican philosopher, 4-330.

Campania [kahmpahn'ia]. It., dept. on s.w. coast; chief city, Naples; 5,214 sq. m.; pop. 3,991,400; fine scenery; very fertile; 4-304.

Campanile. or bell tower; Giotto's tower, 3-392 with illus.; San Marco Venice, 7-388 illus.

Campbell, Sir Colin (Lord Clyde) (1792-1853). Brit. general; served in Peninsular War, Crimean War, and Sepoy mutiny; recipient Lucknow, 4-253.

Campbell, Donald Malcolm (b. 1921). Son of Sir Malcolm Campbell (see below). Achieved world water speed record of 202.35 m.p.h. in turbo-jet hydroplane Bluebird II on Ullswater, July 23, 1955; increased to 216 m.p.h. Nov. 17, 1955, in Nevada.

Campbell, Sir Malcolm (1885-1948). Brit. racing motorist; in 1935 reached 301.13 m.p.h. over the Bonneville Salt Flats, Utah. In 1939 set up a world's water speed record of 141.74 m.p.h.

Campbell, Mrs. Patrick (1865-1940). Brit. actress (Paula in *The Second Mrs. Tanqueray*; Eliza Doolittle in *Pygmalion*). Maiden name Beatrice Stella Tanner.

Campbell, Roy Dunnachie (b. 1902). S. African poet. Works include *The Flaming Terrapin*; *Taurine Providence*; and *Flowering Rifle*; 7-94.

Campbell, Thomas (1777-1844). Scottish poet known for his stirring lyrics ("Hohenlinden"; "Ye Mariners of England"; "Lord Ullin's Daughter").

Campbell-Bannerman, Sir Henry (1836-1908). Brit. Liberal leader; premier 1905-08, 7-351.

Campbell Islands. Small uninhabited group s. of New Zealand.

Campeche, Mexico. State on w. side of Yucatan peninsula; 19,670 sq. m.; pop. 84,000; cap. Campeche (pop. 20,000).

Camperdown, Netherlands. VII. on North Sea coast; Brit. naval victory over Dutch (1797).

Camphene. An extract from turpentine, used as lamp fuel, 4-143.

Camphor. An aromatic gum, 2-192.

Campine coalfield. 3-433.

Camping. 2-192; pitching a tent, 4-21 illus.

Campion, Edmund (1540-81). Eng. Jesuit commissioned to minister to Roman Catholics in Eng., when at that time Roman Catholicism was forbidden. Arrested and charged with conspiracy against the crown. Imprisoned in Tower of London, tortured and later executed.

Campion, Thomas (c. 1567-1620). Eng. poet and musician; (*A Book of Ayres*; *Songs of Mourning*). Both words and music are full of charm.

Campion. Flower, 2-193.

Campo Formio. It., market tn.; treaty of (1797), 5-318.

Campo Santo. In Italy, burial ground ("holy field"), esp. the cloistered cemetery (13th cent.) at Pisa, badly damaged in war (1944).

Campus Martius. Large field on Tiber near anc. Rome used for military drills and assemblies.

Camrose, William Ewert Berry, 1st Viscount (1879-1954). Brit. journalist and newspaper proprietor, 2-194 and Kemsley 4-397.

Camshaft. In internal-combustion engine, 4-274.

Cana, of Galilee. A village in Palestine near Nazareth; here Jesus Christ turned the water into wine at the marriage feast. (John II.)

Canaan. Name given to Palestine ("the promised land") in the Bible, 4-371.

Canaanites. Name given to the Phoenicians in the Bible, 4-371, 6-161.

Canada. A federal autonomous union within the Brit. Commonwealth; area over 3,815,000 sq. m.; pop. 11,009,429, 2-195; map f. 2-197; flag, 3-344 illus. f.; plants and animals, 2-195, 196; Rocky Mts., 6-425; Mackenzie r., 5-61; Red Indian pop., 6-375.

In industry. 2-202; mining, 2-81; copper, 2-503; asbestos, 1-263; natural gas reserves, 5-331; oilfields, 6-150; lumbering, 6-49; agriculture, 2-198; Canadian Pacific Ry., 6-358, 359; 5-5 illus.; steam locomotive, 5-11 illus.; government, police, defence, 2-200; Royal Canadian Mounted Police, 6-253 with illus.; abolition of right of appeal to Privy Council (1949), 6-292.

History. 2-82, 84; early exploration, 1-136; Hudson's Bay Company, 4-200; settlements in Ontario, 5-513; Macdonald and the establishment of the dominion, 6-62; Brit. victories in Seven Years' War, 7-2, 7-465; Alaskan boundary settlement, 1-90; 2nd World War, 7-494-497 with illus.; atomic espionage, 1-305; anti-submarine warfare, 1-294; difference between Fr. and Brit., 2-200; literature and arts, 2-203; ice-hockey, 4-232. *See also* names of provinces, towns, rivers and lakes.

Canada Balsam, resin from Balsam fir; used in optical work, 3-353.

Canada geese. 4-16, 47 illus.

Canadian Pacific Railway, construction, 6-358, 359 with illus.; Brit. Columbia and development of, 2-82; and Manitoba, 5-115; Sir John Macdonald and, 6-62.

Canadian pine, species of pine, 6-204.

Canadian Shield. Low plateau covering about half of Canada, 2-195.

Canalgre [kan'gr]. A variety of dock; root used in tanning.

Canal. 2-204; Panama canal, 6-53; on Rhine, 6-390; Amsterdam, 1-141.

Canal du Midi. French canal; with rivers connects the Mediterranean and the Bay of Biscay, 2-205.

Canaletto, (Canale) Antonio. (1697-1768); architectural painter of

CANIS MINOR

NOTABLE CANALS

Name	Country	Length, Miles
Albert	Belgium	79
Amsterdam-Rhine	Netherlands	45
Baltic-White Sea	Russia	141
Don-Volga	Russia	63
Erie	U.S.A.	340
Göta	Sweden	115
Grand	China	850
Grand Union	England	240
Juliana	Netherlands	22
Kiel	Germany	61
Manchester	England	35
Moscow-Volga	Russia	79
Panama	Canal Zone	50.7
Rhône	France	48
Marseilles	France	48
St. Lawrence	Canada	46
Sault Ste. Marie	Canada	1
Sault Ste. Marie	U.S.A.	1
Suez	Egypt	103
Welland	Canada	25

Venetian school, famed for his rendering of buildings by waterside, e.g. Venice, London, 4-319.

Canary. Bird, 2-207.

Canary grass. 4-frontis.

Canary Islands. Spanish island group in Atlantic 60 m. off N.W. coast of Africa; area 2,808 sq. m.; pop. 818,426; cap. Santa Cruz, 2-207, 7-103; banana cultivation, 1-360; pirates, 6-206.

Canberra. Cap. of Australia; pop. 16,905, 2-209, 1-319, 5-102.

Canberra, aircraft, record Atlantic crossing, 1-292.

Cancer or the Crab. Constellation 2-490 diag.; in Zodiac, 7-524 illus.

Cancer. A malignant spreading growth in the human body; radium used in treatment of, 6-352; and X-ray, 7-195; of the lung, 5-53.

Cancer, Tropic of. So named because sun is in "Cancer," sign of zodiac when over Tropic, 4-153.

Candia or **Heraklion.** Spl. largest city and former cap. of Crete; pop. 51,541, 2-327.

Candide. Brilliant satirical story by Voltaire, 7-106.

Candle, for lighting, 2-210; combustion of, 3-329; in lanterns, 4-113.

Candlemas. Church festival, Feb. 2 in commemoration of presentation of Christ in Temple.

Candle nuts. Variety of oil-producing nut, 5-487.

Candle-Power. Measure of the intensity of a source of light. First defined as the intensity of a spermaceti candle of certain dimensions burning at a certain speed. In 1898 this was replaced in Great Britain by a pentane lamp. From 1909 carbon filament lamps were used as secondary standards to maintain a uniform "international candle" in Great Britain, the U.S.A. and France. In 1950 a new standard was introduced in the form of a tube of thorium immersed in pure platinum. When the platinum is at its melting point (1,773° C.) the intensity of full radiation from the end of the tube is 58.0 international candles or 60 "new candles" per sq. cm. The new unit has been called the candela. *See* Lumen; Lux.

Candolle [kahndol'], Augustin de (1778-1841). Swiss botanist; introduced natural as opposed to artificial or Linnaean system of classification.

Can'dyust. Garden flower of genus *Iberis*, some short rock plants, some tall, white to purple; name taken from Candia (Crete).

Canes. Cap. of Crete; pop. 35,237-2-527.

Canine teeth. In mammals, 5-102, 7-236 with illus.

Canis. The dog genus; includes dogs, jackals, wolves.

Canis major or the **Great Dog.** Constellation, 2-490 diag.

Canis minor or the **Little Dog.** Constellation, 2-490 diag.

CANKER

Canker. Disease affecting plants and animals. Tree canker results from attack of fungus through broken bark. In dogs and cats canker affects the ear, and causes inner lining to become ulcerated. Caused by wax, dirt, or parasites.

Cankerworm. Caterpillar destructive to trees.

Cannabis indica. Species of hemp producing a powerful drug known as hashish or marijuana, 4-161.

Cannae [kan'ne]. Anc. vil. near S.E. coast of It. where Hannibal annihilated Rom. army (216 B.C.); battle, 4-127.

Cannel coal. 2-128.

Cannes [kanl]. Fr. seaport and fashionable winter resort on Riviera; pop. 45,500, 6-403.

Cannibalism, and magic, 5-77.

Canning, George (1770-1827). Brilliant Eng. statesman and orator; as foreign secretary, supported Liberal tendencies; recognized independence of revolted Span. colonies in S. Amer.; d. four months after becoming prime minister.

Canning, of food, 2-210.

Cannock Chase. Sandstone plateau in Staffs. Eng. collieries, 7-141.

Cannon. Weapon; origin of word, 1-254; early use by Edward III, 3-357. See also **Artillery**.

Cannon, in billiards, 1-415.

Cannon ball, 1-258.

Cannon-bone (horse). See **Shank**.

Cano, Alonso (1601-67). Span. architect, painter, and sculptor; chief architect of Granada cathedral; religious paintings characterized by bold design and pure effects; for variety of his talents has been dubbed "the Spanish Michelangelo".

Canoes. See **Boats and Canoes**.

Canon. A dignitary of the Church, receiving a stipend out of the estate of a cath. or collegiate church, 2-273, 2-387.

Canon (song). See **Round**.

Canonical books, of Old Testament, 1-111.

Canonical hours. Set hours of prayer in the Christian Church. Matins—soon after midnight; Lauds—daybreak; Prime—6 a.m.; Terce—9 a.m.; Sext—noon; Nones—3 p.m.; Vespers—6 p.m.; Compline—bedtime.

Canonisation. Roman Catholic ceremony at which a deceased person is formally declared by the Pope to be a saint. It is preceded by (1) declaration that the person is "venerable," (2) lengthy inquiry into sanctity and proof of miracles performed resulting in "beatification," (3) another long period during which proof of performance of two miracles since beatification is shown. The "Devil's Advocate," or promoter of the Faith, cross-examines all witnesses.

Janopus. Star of the first magnitude, 7-116.

Canossa. It. ruined castle 12 m. S.W. of Reggio; here the emperor Henry IV did penance before Pope Gregory VII (1077), 4-7.

Canova, Antonio, Marquis of Ischia (1757-1822). It. sculptor; great influence as leader of classic revival, 6-321.

Can'so, Strait of, or Gut of. Passage between Nova Scotia and Cape Breton Isl.

Cantabile. See **Musical Terms** (table). **Canta brian Mts.** Range extending W. from Pyrenees across N. Spain over 300 m., bordering Bay of Biscay; highest pt. 8,743 ft.; 6-314.

antaloup. Variety of melon, 5-167.

Antata. In music, 5-305.

Anteat. Communal feeding place for workers, 5-153 illus.

Antebury. Cathedral city in Kent, Eng.; pop. 27,775, 2-213; St. John's Hospital, 1-119; cathedral, 2-268 illus.; as ecclesiastical metropolis, 4-368; pilgrims, 6-202; shrine of Thomas Becket, 1-401; arms, 4-165 illus. f.

Canterbury, Archbishop of. Chief dignitary of the Church of Eng.; Primate of all Eng., the Archbishop of York being the Primate of Eng. **Canterbury bell.** Biennial flower of family *Campanulaceae*; blossoms white, blue, rose; height about 3 ft. **Canterbury Plains.** S. Island, New Zealand; sheep-rearing, 5-422.

Canterbury Tales. The. Series of tales in verse by Geoffrey Chaucer, 2-311; stories retold, 2-312, 313.

Cantharidin. Medicinal substance procured from blister beetle, used for raising blisters on skin, 1-415.

Cantilever. In bridge construction, 2-61 with diag.; 2-64 with illus.

Canton or Kwangchow; cap. of Kwangtung prov., China; pop. 2,100,000, 2-214.

Canton. Name for an admin. division in Switz. and Fr. In Switz., cantons are states of the federation. In Fr., word is used for a much smaller area, midway between a parliamentary division and a parish. Fr. has about 3,000 cantons, Switz. 22.

Canton River. Also called **Chu-kiang** ("Pearl River"), main channel of the delta formed by the Si-kiang.

Canute (c. 991-1035). King of Denmark, Norway, and England (1017-35), 2-215, 3-276.

Canyon [kan'youn]. Type of river valley with precipitous sides, 6-188; Grand Canyon, 4-60.

Canzonetta. See **Musical Terms** (table). **Caoutchouc tree** (*Hevea brasiliensis*), the rubber tree; plantations, 6-464.

Cap. Type of hat, 4-136.

Capablanca (kapablank'a). **José Raoul** (1889-1912). World-famous chess-player, a native of Cuba; gained world title in 1921, 2-328.

Capacitance. The property of a body by virtue of which a quantity of electricity has to be imparted to it to raise its potential above that of the surroundings. The capacitance between two bodies is the ratio of the charge to the potential between them. In a capacitor (condenser) capacitance is the quantity or charge of electricity on the positive plate, 6-310 illus. f.

Capacitor or Condenser. Piece of electrical equipment consisting of two conducting plates separated by a layer of insulating material (the dielectric). When a voltage is applied to the plates, the latter accumulate and store a low voltage charge; this is called the capacitance and varies or is variable according to the type. Capacitors used in radio circuits generally have air or paper dielectrics and their capacitance is varied by altering the distance between the plates. A storage battery is a form of capacitor; 3-215, 4-259.

Cape Breton Island. Canada. Separated from Nova Scotia by Strait of Canso, 5-169; Canso's discovery, 2-156.

Cape buffalo. 2-109.

Cape Cod, Massachusetts, U.S.A. L-shaped peninsula between Nantucket Sound and Cape Cod Bay; length 65 m., width 1 to 10 m., 5-144; landing of Pilgrim Fathers, 6-201.

Cape Colony. S. Africa; S. African history, 2-81.

Cape Dutch. See **Afrikaans**.

Cape Girardeau, on Mississippi r., 5-226.

Cape Gooseberry. Perennial plant native to S. Amer., cultivated in Gt. Brit. Height 3 ft. Downy heart-shaped leaves. Whitish flowers. Distended bladder-like calyx, which turns reddish-orange, contains a gold berry.

Capek [chap'ekl. **Karel** (1890-1938). Czech author and playwright, his plays include *The Insect Play*, *R.U.R.*, and *The Mother*.

Cape linear foot. See **Weights and Measures** (table).

Capella. Star of the first magnitude, 7-116.

Capelle, Jan van de (1624-75). Dutch painter, 5-384.

CAPTAIN

Cape of Good Hope. Prov. of Union of S. Africa; area 277,113 sq. m.; pop. 4,378,078; 2-215, 7-88 and illus. f. 89, 90; early settlement, 1-51; industries, 2-217; stamp, 7-113 illus.

Capersaillie. Bird, species of grouse, 4-99.

Capernaum [kapér'naum]. Anc. town of uncertain position; perhaps on N. coast of Sea of Galilee; often visited by Jesus, 6-148.

Capet, House of. Fr. royal family from 987 to 1328, 3-149; for list of rulers see **France**.

Capet, Hugh (c. 939-990). King of France, elected by nobles and prelates to succeed Louis V, last of the Carolingians; founds Capetian dynasty, for which see list under **France**.

Cape Town. Cap. of Cape of Good Hope, prov., Union of S. Africa; pop. (1951 census) 591,511, 2-217; early settlement, 1-51; in S. African history, 2-84; 7-92; air view of city, 2-216 illus.

Cape Verde Islands. Portuguese island group off the W. coast of Africa; area 1,557 sq. m.; pop. 181,286, 2-218, 6-268.

Capillaries (from Lat. "hairs"). Smallest blood-vessels, in general forming a fine mesh between the end of an artery and the veins; in circulation of blood, 1-493, 4-144.

Capillary attraction. The property of a liquid to rise or fall, as in a narrow tube, caused by an unbalanced attraction between molecules at the surface of a liquid. Common examples are the action of wicks and blotting paper, 7-192.

Capital. See **Architectural Terms**.

Capital. In economics, 3-160.

Capitalism. System of private ownership of capital, esp. of the concentration of capital in hands of a relatively small number of people. Societies under capitalism are distinguished by private property, free enterprise, and competition with profit as motive. In some countries, e.g. U.S.S.R., individual capitalism has been supplanted by state capitalism.

Capital punishment. Death penalty imposed by law for certain serious offences; in Eng. law, 6-290; has been abolished by several countries; in 1956 a Private Member's Bill to abolish it in the U.K., introduced by Sydney Silverman, was passed by the Commons on a free vote, but rejected by the Lords (who in 1948 had defeated suspension of the death penalty for a trial period).

Capitol, The. The U.S. houses of parliament, in Washington, D.C., 7-121, 422 illus.

Capitoline [kap'itolin] Hill. Smallest but most famous of 7 hills of Rome; shrine of Jupiter, 4-356.

Capone, Al (1895-1947). Notorious Amer. gangster, 2-335.

Caporetto. Battle of, in 1st World War, 7-481.

Cappadocia (kapadōsh'ia). Ancient country in Asia Minor W. of r. Euphrates; conquered by Persians and Alexander the Gt.; made Rom. prov. by Tiberias A.D. 17.

Capra (genus). See **Goat**; **Ibex**.

Capri [kah'pri]. Beautiful Isl. S. of Bay of Naples, It.; 5½ sq. m.; resort of tourists and artists; blue grotto, 2-276, 278 illus.

Capricorn. Tropic of, 4-153. So named because sun is in "Capricorn" sign of zodiac when over the Tropic.

Capricornus (the Goat), sign of Zodiac, 7-524 illus.

Caprimulgidae. Family of birds, including nightjar, 6-139.

Caps. See **Hats and Caps**.

Capscum. Pepper-producing annual plant or evergreen shrub, of tropical Amer.; some 90 species.

Capstan. See **Nautical Terms** (list).

Captain. Commissioned rank in Royal Navy and the Brit. and other armies. Title also given to chief pilots of civil

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aircraft. In the R.N. a capt. ranks above a commander, below a commodore. In Brit. army, capt. ranks above a lieutenant and below a major; insignia in R.N., 5-351 illus.

Captains Courageous (1897). Story by Rudyard Kipling dealing with life on the Newfoundland fishing grounds, 4-412.

Capua. It. city 20 m. N. of Naples; noted for cheese-making; pop. 10,000.

Capuchin monkey, 5-210 illus. f.

Capuchins. Branch of the Franciscan friars; extreme vows of poverty, and much attention to learning.

Capulet, noble family of Verona; feud with the Montagues forms basis for tragedy of Shakespeare's *Romeo and Juliet*, 6-449.

Capybara, the largest rodent, found in S. America.

Carabobo, Venezuela. Plain 20 m. S.W. of Valencia; victory of Bolívar over Spaniards (1821) established Colombian independence.

Caracal, or caracul. Type of lynx, native to Africa and S. Asia; reddish brown with white underparts; easily tamed and used for catching rabbits in India; fur, 3-196, 5-35.

Caracalla (188-217). Rom. emperor, real name *Severus Alexander*; succeeded 211; baths of, 6-429 illus. f.; bust, 6-444 illus.

Caracas (karah'kas). Venezuela, cap. 6 m. from apt. La Guaira, on Caribbean Sea; pop. 487,903; 7-345, 386 illus.; Bolívar and, 1-506.

Caracci (kahrah'chè), Annibale (1560-1609). It. painter, greatest of the three Caraccis, 4-320.

Caracci, Ludovico (1555-1619). The founder of the Bolognese or eclectic school of painting, 4-320.

Carac'taus. Brit. chieftain, son of Cimboblin; opposed Romans; defeated A.D. 51 after 8 years' war, imprisoned at Rome, 2-73. Tacitus ("Annals," bk. XII, chap. 37) quotes noble speech he made before Rom. emperor.

Caraffa, Giovanni Pietro. See Paul IV (pope).

Caramel, for flavouring and colouring, 7-186.

Carat. Degree of purity of gold; unit of weight for precious stones; gold purity, 4-10.

Caravaggio [kahrah'yah'jō], Michelangelo Merisi da (1569-1609). It. painter of religious and genre subjects, founder of the naturalistic school, 4-320.

Caravan. Term used in Asia, N. Africa to describe number of persons travelling together over long distances; transport in Asia, 1-266; route through Khyber Pass, 1-46.

Caravan. Residential vehicle; trailer caravans, 2-193 illus.; gypsy, 4-110, 111 illus.

Caraway seeds, 7-131 illus.

Carbajal [karbah'hah], Francisco de (1544-1548). Sp. soldier; with Cortés in Mexico and Pizarro in Peru; his valour gave him nickname "Demon of the Andes."

Carberry Hill, 7 m. S.E. of Edinburgh; Mary Queen of Scots taken prisoner (1567).

Carbide. Compound of carbon with boron, silicon, or a metal.

Carbohydrates, compounds containing hydrogen and oxygen (in proportions of two to one) with carbon; in diet, 3-409; and sugar, 7-186.

Carbolic acid or Phenol, 2-219; from coal-tar, 2-434; used by Lister as an antiseptic, 1-177, 4-522; as poison, 6-236.

Carbon (C). Element closely related to silicon; atomic no. 6; atomic weight 12.01; in electric cables and arc lamps, 2-219; 3-224; atomic properties, 2-219; and hydrogen, 4-221.

Carbon bisulphide, 7-187.

Carbon black, 2-219; in motor tyres, 6-465.

Carbon dioxide. Colourless gas (CO₂), 2-219 in air, 1-79, 81; as anaesthetic, 1-142; and explosions, 3-329; in fermentation, 1-90; making "dry

ice," 3-165; in refrigeration, 6-378, in respiration, 6-389; given off by plants, 6-215, 6-183, 4-469.

Carbonic acid gas, as stimulus to breathing, 5-52.

Carboniferous limestone, and Yorkshire potholes, 4-510.

Carboniferous period, in geology, 3-515, 516, 7-315.

Carbon microphones. Variety of microphone, 5-193, 194 illus.

Carbon monoxide. Gas (CO), 2-220; as poisonous gas, 6-236.

Carborundum, or silicon carbide, an abrasive, 7-53.

Carboxyl group. Acids (COOH); atom arrangement; examples, 1-12.

Carbuncle. Acute inflammation of tissue beneath the skin; resembles boil in early stages, but much more painful and often accompanied by constitutional disturbances such as chills or fever.

Carbuncle. A garnet cut with a convex surface and flat or concave below in order to lighten the colour; name applied by ancients to all red and fiery-coloured stones, including ruby.

Carburettor, in internal combustion engine, 4-275 diag.

Carcassonne [kahrkasson'l]. Fr. city on R. Aude; pop. (1946) 38,110; wine market; medieval fortress, wall attributed to Visigoths, 3-436 illus.

Cardan [kahrdahn'l], Jérôme (Hieronymus Cardanus, also Girolamo Cardano) (1501-76). Italian mathematician, physician, and astrologer; among his ideas was his indication of method of teaching the blind to read and write by sense of touch, and use of signs in teaching the deaf.

Cardenas [kahrdänas], Lazaro (b. 1895). Pres. of Mexico, 1934-40; defence minister, 1943-45; retired 1945; a socialist, his oil nationalisation decree led to rupture of diplomatic relations with Brit.

Cardiff. Capital city of Wales; apt., and co. tn. of Glamorganshire, population 243,627, 2-220, 4-27, 7-412.

Cardigan, James Thomas Brudenell, Earl of (1797-1868). Commander in "Charge of the Light Brigade" at Balaklava, 1854, celebrated in Tennyson's poem.

Cardigan. Co. tn. of Cardiganshire, Wales; pop. 3,497; extensive docks, iron and copper works, flour milling, 2-221.

Cardiganshire. Co. of Wales, area 692 sq. m.; pop. 53,267, co. tn. Cardigan, 2-220.

Cardinal. Highest dignity of R.C. Church next to Pope. There are three ranks, cardinal-bishop, cardinal-priest, cardinal-deacon; now usually bishop. Insignia are the scarlet skull-cap, biretta and red hat. College of Cardinals is advisory body to Pope, 6-62, 126.

Cardinal beetle, 4-269 illus.

Cardinal bird. Red-feathered bird of finch family, found in N. Cent. and S. America.

Cardinal flower. A tall perennial plant (*Lobelia cardinalis*) with alternate, oblong, slightly toothed leaves, and bright red irregular flowers clustered in leafy terminal spikes.

Cardinal numbers. Simple names of the numbers (one, two, three, etc.) as opposed to ordinals (first, second, third, etc.).

Cardinal points of compass. Four chief directions (N., S., E., W.) 2-475.

Cardinal virtues. The four chief virtues, viz. justice, prudence, temperance, fortitude, on which all others hinge (Lat. *cardo*, a hinge).

Carding. Process in cotton and wool mfr., 2-518 illus., 520, 7-474 with illus.

Cards, Playing, 2-221.

Carducci [kahrdoo'chè], Giosuè (1836-1907). It. poet, greatest of later 19th cent. and liberator of It. poetry from hitherto fashionable sentimental romanticism, 4-330.

Cardwell, Edward Cardwell, Viscount (1813-86). Brit. statesman who, when sec. of state for War, made

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drastic army reforms including the institution of short service, creation of the army reserve, abolition of purchase of commissions.

Careers and How to Choose Them, 2-232; in Merchant Navy, 5-172; R.A.F., 6-462; Royal Navy, 5-355; nursing, 5-485. Address list, 8-549.

Carew, Thomas (c. 1598-c. 1638). Eng. poet; earliest of "Cavalier poets"; famous for love lyrics; for a time at court of Charles I.

Carey, Henry (c. 1690-1743). English poet and composer of musical farces and songs; best known for "Sally in 'Our Alley'"; was long reputed author of "God Save the King."

Carey, William (1781-1834). Brit. oriental scholar and first Baptist missionary to India; leader in 19th cent. Prot. missionary movement; translated Bible into many oriental languages.

Carey Street. Thoroughfare in W. central London, wherein is situated the bankruptcy court. Name has become synonymous with bankruptcy.

Cargo ships, types of, 7-32.

Caria. Anc. country in S.W. corner of Asia Minor; contained Gk. tns. of Miletus and Halicarnassus.

Carib. S. Amer. Indians; "cannibal" derived from name (Caribal); gommo boats, 1-500 illus.

Caribbean Sea. Arm of Atlantic, 750,000 sq. m. enclosed by E. coast of Cent. Amer., N. coast of S. Amer., 2-242.

Caribou. Wild reindeer of N. Amer. (*Rangifer tarandus*), 2-242, 3-59.

Carillon [kar'ilyon], or *glockenspiel* [glock'enspel]. Set of bells or metal bars arranged so that tunes may be played upon them, 1-426.

Carinthia. Dist. of S. Austria, mining, (especially lead) and mfg., pine forests; chief city Klagenfurt.

Carlishrooke Castle. Norman castle at Carlishrooke, Isle of Wight, in which Charles I. was imprisoned for nearly a year (1647-48), 7-450.

Carleton, William (1791-1869). Irish novelist, author of several powerful stories; *Traits and Stories of the Irish Peasantry* (1830-1833).

Carleton University. At Ottawa, Ont. Anglican; founded 1912, 6-10.

Car line thistle. Grows in poor soils of Europe; so named because of supposed medicinal use by Charlemagne; seeds, 6-529 illus.

Carlisle. Co. tn. of Cumberland, near Scot. border; pop. 67,891, 2-242, 3-9.

Carlists. Span. political party, supporters of the descendants of Don Carlos, heir-presumptive to Span. throne until abrogation of Salic law was confirmed in 1830; waged civil war in which they were defeated (1833-40); defeated again in war of 1873-76; they supported the Nationalists in civil war of 1936-39.

Carlisle Forest, Scot.; storm damage 7-170 illus.

Carloman (768-771). Brother of Charlemagne, joint ruler of the Franks, 2-306.

Carlos I (1863-1908). King of Port. succeeded 1889; suspended constitution 1907; assassinated while driving in Lisbon.

Carlos, Don (1545-88). Son of Philip II of Spain; vicious weakling about whose disappointments in love (his father married Carlos's fiancée, Elizabeth of France) and mysterious death Schiller and others have woven romances.

Carlos, Don (1788-1855). Uncle of Isabella II of Spain and first Carlist pretender to Sp. throne; called Charles V by followers. See *Carlists*.

Carlos, Don (1848-1909). Claimant to the Sp. throne; after failure in 1st War of 1873-76, he retired to Fr. and It. See also *Carlists*.

Carlot's (1840-1927). Empress Mexico; wife of Maximilian, a daughter of Leopold I of Belgium; went insane after execution of husband, and lived near Brussels.

Carlovingians. See *Carolingians*.

CARLOW

Carlow. Second smallest co. of Irish Rep., in Leinster prov.; area 346 sq. m.; pop. 34,168. Highest point *Mt. Leinster* (2,610 ft.). County is noted for its butter and bacon; agriculture is principal occupation.

Carl Rosa Opera Company. 5-516.

Carlsbad. See *Karlbad*.

Carlsbad caverns. New Mexico, U.S.A.; underground system of caves covering 71 sq. m.; 5-400.

Carlton Club. London club, in Pall Mall; headquarters of Conservatism since its foundation by the Duke of Wellington, in 1832.

Carlton House. Former London mansion in Pall Mall, where the Duke of York's Column now stands; built by Henry Boyle, Baron Carleton, who left it to the Prince of Wales (afterwards George IV); pulled down in 1827; the columns were used for the National Gallery. *Carlton House Terrace* perpetuates the name.

Carluke. Fruit farming centre in Lanarkshire; jam factories, 4-414.

Carlyle, Jane Welsh (1801-68). Witty, brilliant, sharp-tongued, but devoted wife of Thomas Carlyle, 2-213.

Carlyle, Thomas (1795-1881). Brit. philosopher, writer and historian 2-243; 3-290; biog. of *Fred. the Gr.*, 3-462; controversy with Huxley, 4-212; Whistler's portrait of, 3-262 illus.

Carman, William Bliss (1861-1929). Canadian poet of the open air. Pub. several volumes of verse. Represented in many anthologies. 2-203.

Carmarthen. Co. tn. of Carmarthen-shire, Wales, pop. 12,121; wool centre in Middle Ages; 3-211.

Carmarthenshire. Co. of Wales; area 920 sq. m.; pop. 171,000; co. tn. *Carmarthen*, 2-244.

Carmel, Mt. Hill in Israel, near Medfa and Haifa; associated with the prophets, Elijah and Elisha; Carmelite order founded there by hermits; 6-17 illus.

Carmelite Friars. Mendicant order of "Our Lady of Mount Carmel," founded 1207; called White Friars in Eng. because of white mantle, 5-215.

Carmen. Opera by Bizet; story, 5-516.

Carmona, Antonio Oscar de Fragoas (1869-1951). President of Portugal 1928-51. Rose to rank of army general before entering politics.

Carmine. Red colouring matter derived from the cochineal insect.

Carnac, France. A Breton village famous for ancient stone monuments in vicinity.

Carnallite. One of the principal magnesium ores, 5-81.

Carnarvon, George Edward Herbert, 5th Earl of (1860-1923). Brit. Egyptologist; with Howard Carter and others made the discovery of Tutankhamen's tomb.

Carnarvon (Wales). See *Caernarvon*.

Carnatic or Karnatak. Region in Madras state, extending along E. coast of S. India.

Carnation. Cultivated variety of pink, 2-244.

Carnation grass. 4-frontis.

Carn Easlie. Peak in Morayshire, Scot., 2,329 ft., 5-261.

Carnedd Dafydd. Mt. in Caernarvonshire, Wales, 3,426 ft., 7-77.

Carnedd Llwyelyn. Mt. in Caernarvonshire, Wales, 3,484 ft., 7-77.

Carnegie, Andrew (1835-1919). Scot.-Amer. iron master and philanthropist, 2-244; and public libraries, 4-486.

Carn Elge. Summit in Ross and Cromarty, Scot., 3,877 ft., 6-455.

Carnelia. or *cornelian*; silica in, 7-53.

Carnes, Primo (b. 1907). It. heavyweight boxer of remarkable size—6 ft. 5½ in. tall, with other measurements proportionate. Became world champion 1933 by knocking out Jack Sharkey, but was knocked out by Max Baer, 1934.

Carniola. Former prov. in s.w. Austria-Hungary; following 1st World War included in Yugoslavia, except small strip to It.

Carnivora. Order of flesh-eating mammals, 5-103.

Carn Mair. Mt. Inverness-shire; highest point of the *Monadhliath mts.*, 4-275.

Carn Mor Dearg. Mt. Inverness-shire, Scot. (4,012 ft.), 4-275.

Carno, Monte. Highest point of Apennines (9,560 ft.), 4-308.

Carnot (kahrnô). Lazare Nicolas Marguerite (1753-1823). Fr. statesman, general, mathematician, and military author; member of Committee of Public Safety and of Directory.

Carnot, Marie-François Sadl (1837-91). Fourth pres. of Fr. (1887-94); assassinated; grandson of L. N. M. Carnot.

Carnot, Sadl Nicolas Leonard (1796-1832). Fr. physicist, formulator of "Carnot's principle," or the second law of thermodynamics; son of L. N. M. Carnot.

Car'notite. ore of radium and uranium.

Carnsore Point. promontory in s.e. of co. Wexford, Irish Republic; the extreme s.e. point of Ireland.

Car'ob tree (*Ceratonia siliqua*). a native of the Levant; an evergreen, its pulp is used as a food for horses and sometimes for human beings, and called St. John's bread.

Carol I (1839-1914). King of Rumania; elected prince 1866, crowned first king 1881; married Elizabeth of Wied ("Carmen Sylva"); 6-470.

Carol II (1893-1933). King of Rumania, 6-470.

Carolina. Two states of the U.S.A. North Carolina, area 52,712 sq. m.; pop. 4,061,929; South Carolina, area 31,000 sq. m.; pop. 2,117,027. 2-244.

Caroline of Anspach (1683-1737), queen of George II of Eng., 3-521.

Caroline of Brunswick (1768-1821). Queen of George IV of Eng.

Caroline Islands. Coral group in Pacific E. of Philippines; includes Ponape (pop. 11,000); Yap (6,000); 6-26.

Carolingians. Frankish rulers, 751-987, descendants of Charles Martel, 3-449; Aachen as cap., 1-1.

Car'otene. Vitamin A-containing substance in carrots, etc.; in dried grass, 4-61; formula, 2-322; and colour vision, 2-465.

Carot'id artery. One of the two great arterial trunks of the neck (l. and r. sides) that convey blood to the brain.

Carp. Fresh-water fish, 2-245, 3-380; bait for, 3-383.

Carpaccio (kahrpah'chô). *Vittorio* (c. 1450 c. 1522). Venetian painter, among greatest of early Renaissance ("Life of St. Ursula"), 4-318.

Carpals. eight bones in the wrist, 4-125.

Carpathians. Mts. in cent. Europe 2-245, 3-309.

Carpatho-Ukraine. Another name of former Czech province of Ruthenia. Incorporated in U.S.S.R., 1915.

Carpel. That part of a flower comprising the female organs, 3-395, 2-24.

Carpenter, Edward (1814-1929). Brit. social reformer. Books include *Towards Democracy*, *Civilization: Its Cause and Cure*.

Carpenter, George Lyndon (1872-1948). Australian evangelist, leader of Salvation Army 1939-46.

Carpenter, John (c. 1370-c. 1441). Eng. merchant and philanthropist, town clerk of London 1417-38, secretary to Dick Whittington and M.P. for city in 1436 and 1439. Left large sums for charity including a bequest for a school for poor boys which in 1834 became the City of London School.

Carpenter bee; life of, 1-407, 409 illus.; nest, 4-269.

Carpentier (kahrpah'n'tyâ), *Georges* (b. 1891). Fr. boxer; won world's "white" heavyweight championship in 1914; defeated by Dempsey in U.S.A. (1921).

Carpetbaggers. northern U.S.A. politicians who settled in the south, after Civil War. Term used in Gt. Brit. for a candidate for Parl. who is entire stranger to the constituency.

Carpets and Rugs. 2-246; Queen Mary's carpet, 5-141.

Carrageen. See *Irish Moss*.

Car'raunt'hill (carantool'), loftiest mt.

CARTOUCHE

in Ir., part of the *Macgillivuddy Reeks*, also called *Carrnall* and *Carrnall*; 3,114 ft. high, 4-281.

Carrara (kahrrah'ra). It. city 60 m. N.W. of Florence; pop. 52,000; famous marble quarries, 5-121.

Carriekfergus. Historic Irish spt. in N. Ire., 9 m. S.W. of Belfast; pop. 8,650; 12th cent. castle.

Carrier pigeons. 6-108.

Carrier wave. A continuous electromagnetic wave motion, of constant amplitude and frequency, emitted by a radio transmitter. By modulation (q.v.) of the carrier wave electric impulses caused by sounds at the broadcasting source are transmitted by the carrier wave to the receiver, 6-340 illus. 1.

Carri'on-crow. 2-536; compared with raven, 6-367.

Carroll, Lewis (1832-98). Brit. writer, real name Charles Lutwidge Dodgson 2-251; story of *Alice in Wonderland* 2-354; verses, 2-356.

Carroll, Paul Vincent (b. 1900). Irish dramatist, 4-287.

Carron oil. constituents, 4-509.

Carrot. Root vegetable of the *Umbelliferae*, related to parsley, parsnip, and hemlock; introduced by Dutch in 16th cent.

Carrying charges. See *Stock Exchange Terms*.

Carshalton. Urban dist. of Surrey, Eng., 11 m. S. of London. Residential area, in outer ring of London suburbs. Pop. 62,801.

Carson, Sir Edward Henry Carson. Baron (1854-1935). Brit. criminal lawyer and Unionist politician; head of Ulster rebellion against Brit. government's Home Rule Bill for Ireland (1912-13).

Carson City. Cap. of Nevada, U.S.A.; pop. 3,082, 5-393.

Cart. type of brake used, 2-42.

Cartagena (kahrtag'ena). Colombia. Spt. on Caribbean Sea; pop. 81,980; exports coffee, hides, woods, tobacco; founded in 1533.

Cartagena, Spain. spt., mfg. city, and mining centre in s.e. on Mediterranean; pop. 113,160; naval station; founded 3rd cent. B.C. by Carthaginians.

Carte, Richard D'Oyly (1814-1901). Brit. theatrical manager, producer of Gilbert and Sullivan operas; failed in an effort to found the Grand English Opera House, but achieved great success with touring opera companies, 4-21.

Carter, Howard (1873-1939). Brit. Egyptologist, carried out exploration work in Egypt on behalf of Lord Carnarvon during 1907-23, and amongst his discoveries was the tomb of Tutankhamen, 1-203 with illus.

Cartier, Philip (d. 1796). British naval officer and navigator. Discovered Pitcairn Island and Queen Charlotte Islands; explored and charted St. George's Channel, 6-29.

Cartesian co-ordinates. In geometry, 3-78.

Cartesianism. Philosophy of Descartes, 3-77.

Carthage. Anc. city and state in N. Africa, founded by Phoenicians, 2-265, 1-52, 6-161, 7-325; Hannibal's rule, 4-127; wars with Rome, 6-432; Cato and, 2-273; aqueduct built by Hadrian, 6-446 illus.

Carthusians. Order of monks founded by St. Bruno at Chartreuse, Fr., in 1086, 5-211.

Cartier, Jacques (1494-1537). Fr. explorer. Led expedition across Atlantic, 1534, to discover a route to the East; reached Newfoundland and sailed along E. coast of Canada. On a second expedition, 1536, discovered the Gulf of St. Lawrence, 6-487, 1-136, 2-199.

Cartilage, or gristle, a tough elastic animal tissue.

Cartoon. by Raphael, 6-364 illus.

Cartoons (cinema). See *Animated Cartoons*.

Cartouche (kahrtoh'sh'), in architecture, an ornament in the form of an unrolled scroll; on Egyptian monu-

CARTWRIGHT

ments it is an oblong device with oval ends, containing the name or title of a famous person.

Cartwright, Edmund (1743-1823). Brit. inventor of power-loom, 2-255, 7-134.

Caruso, Enrico (1873-1921). It. dramatic tenor, greatest of his time; gifted with very powerful and beautiful voice.

Carvel-bull. *See* Nautical Terms (table).

Caryatides [kariat'idéz]. In architecture, female figures supporting porches or entablatures; on Erechthion, 4-73 illus. f.

Caryophyllaceae. Family of plants including plinks, carnation and sweet william, 6-205.

Casablanca [kazabán'ka]. Louis de (1755-98). Fr. naval officer, commander of Napoleon's flagship, *L'Orient*, which caught fire at Aboukir; his son Giacomo, aged 10, was the boy who "stood on the burning deck" in Mrs. Hemans's poem; both father and son perished.

Casablanca [karablan'ka] or **Darel Beida**. Spt. of Morocco, on Atlantic; pop. 257,000; wool leather, grain; Allied conference Jan. 1943 between Roosevelt and Churchill decided on unconditional surrender policy towards Germany, 7-193.

Casals [kahzálz]. Pau (b. 1876). Spanish violoncellist and conductor; one of the world's greatest cellists.

Casanova [kasanova]. Giovanni Jacopo (1725-98). Venetian adventurer and writer; famous for *Memories* of his amazing and eventful life.

Cascade Mts., range in Canada and U.S.A., extending from Brit. Columbia to California; highest point Mt. Rainier (14,408 ft.); 5-452, 453, 7-423.

Casarea. Dried bark of the California buckhorn tree. Used as incense and as a laxative.

Caschmon. Primitive plough used in Hebrides, Scot., 6-225, 224 illus.

Caselin. Chief of the three proteins found in milk, 5-205; used industrially for making plastics, 6-219.

Cassment, Roger (1804-1916). Irish conspirator; knighted (1912) for investigation of Congo and Putumayo atrocities; hanged (Aug. 3, 1916) for high treason (being degraded from his knighthood when found guilty), for anti-British activities in Germany and his part in organizing the "Easter Rebellion" of 1916 in Ireland, 2-182, 4-283.

Casement. *See* Architectural Terms.

Cash. A Chinese coin, worth less than one-tenth of a penny.

Cash account. In book-keeping 2-10.

Cashew nuts, uses, 4-187.

Cashmere. Fine woollen material; shawls, 4-37, 4-394.

Casiano district, Mexico; oil wells, 5-187.

Casimir (the Great, reigned 1333-70). King of Poland, 6-240.

Casket Letters. The collection of letters, supposed to be the correspondence between Bothwell and Mary Queen of Scots, 5-142.

Caslon, William (1692-1766). First of a famous family of Eng. type-founders; name is given to type-faces still much used.

Caslon. An old type revived by Monotype Corporation, 5-248.

Caspian Sea. Largest inland sea in the world; 170,000 sq. m., 2-256, 4-438, 6-472.

Casquet Rocks, Channel Is., 2-303.

Cassaba. Variety of melon, 5-167.

Cassandra [kasan'dra]. Daughter of Priam king of Troy; prophetic of woe, doomed never to be believed; in vain warned against keeping Helen and admitting the wooden horse; became Agamemnon's captive; slain with him by Clytemnestra.

Cassava or **Manioc.** Root of tapoca plant, native to S. Amer., 2-47, 7-226-227.

Cassel. *See* Kassel.

Cassia, oil of, as essential oil, 5-506.

Cassinio. Tn. of It. prov. of Naples, at foot of Monte Cassino; key position of Gustav Line in 2nd World

War; Allies assaulted Jan. 30-Mar. 14, 1944; heavily bombed tn., Mar. 14, and destroyed Monte Cassino monastery, Mar. 15; finally took tn. and mt., May 18, 7-191.

Cassino, Monte. *See* Monte Cassino.

Cassiopeia. Constellation of northern hemisphere, 2-491, 490 diag.; Brahé discovers new star in, 2-38.

Cassiterite (tinestone), ore of tin, 7-280.

Cassius (Gaius Cassius Longinus) (d. 42 B.C.). Rom. noble, chief conspirator with Brutus against Julius Caesar's life. When defeated at Philippi by Antony, ordered one of his servants to stab him to death; 2-102.

Cassivellanus. Brit. king conquered by Julius Caesar (54 B.C.).

Casson, Sir Hugh (b. 1910). Br. architect; and South Bank, 1-219.

Cassowary. Australian bird, relative of ostrich, 1-312, 6-9; compared with emu, 3-212.

Castagno, Andrea del (c. 1410-57). It. painter, 4-318.

Castelar y Ripoll, Emilio (1832-99). Span. liberal statesman; dictator of Spain, republic (1873).

Castellón de la Plana [kastelyon' dā lah plahnā], Spain. Mfg. and trade city near Mediterranean; pop. 53,330.

Caste system, among Hindus, 4-212, 4-178, 179, 1-262.

Castiglione [kastilyōnā], Baldassare (1478-1529). It. writer and diplomat, employed on many important missions; author of *The Courtier*, 4-330.

Castile. One of the kingdoms into which Spain was divided before the union of the country under Ferdinand and Isabella (1479). Name derived from numerous castles built as defence against the Moors.

Castilian. Literary dialect of Spain, language, 7-121.

Castings, of bells, 1-425.

Cast iron, properties and uses, 4-293.

Castle, Vernon and Irene. Amer. ball-room dancers, 3-37.

Castle, 2-256. Cardiff, 2-220 with illus.; Colchester, 2-418, 417 illus.; Dover, 3-109; Kenilworth, 4-397 with illus.; Pembroke, 6-110 illus.; on Rhine, 6-390.

Castle Douglas. Tn. in Kirkcubrightshire, Scot., pop. 3,322, 4-113.

Castle Howard. Mansion in Yorks, Eng., built (1701-11) by Sir John Vanbrugh for the 3rd Earl of Carlisle. Has fine picture gallery.

Castlereagh, Robert Stewart, Viscount (2nd Marquess of Londonderry) (1769-1822). Brit. statesman; sec. for Ireland (1798-1800); sec. for war (1805-06, 1807-09); foreign sec. (1812-22); committed suicide.

Castle Rising, Norfolk, 2-258 illus.

Castletown. Tn. in Isle of Man; pop. 1,749, 5-110.

Castor and Pollux. Famous demigods of Gk. myth, 2-261.

Castor and Pollux (constellation) *See* Gemini.

Castor canadensis. N. Amer. beaver, 1-399.

Castoreum. Excretory used in perfumery, obtained from beaver, 6-124.

Castor fiber. European beaver; diminishing numbers, 1-400.

Castor oil. Medicine obtained by crushing seeds or beans of the castor oil plant (*Ricinus* grown in tropical and semi-tropical countries; oil is also used for waterproofing leather, in perfumes and dyes, as lubricant, and in mfr. of varnish, ink, rubber, soap, kerosene, etc.

Cat. Animal of the genus *Felis*, 2-261; claws, 5-102; compared with lion, 4-320; eye, 3-332, 333 illus.; instinct and intelligence, 1-153 illus., 154; characteristics of cat family, 2-262; mummified in anc. Egypt, 5-295; tongue, 7-291.

Catabolism [katab'olizm]. Chemical processes in living tissues which involve the breaking down of more elaborate to simpler compounds.

Catacombs. Underground cemeteries in Rome, paintings in 2-370, 6-33.

Catalan. Dialect of Catalonia, Spain, 1-150, 1-388, 7-104.

CATHERINE HOWARD

Catalonia. Former principality and prov. in E. Sp., granted partial autonomy in 1932; stronghold of Government forces in Spanish Civil War (1936-39), 7-104.

Catalyst. Substance which promotes chemical reaction without itself undergoing any chemical change, 2-322; platinum, 6-222; 7-192; in oil refining, 6-151; chlorophyll as photo-catalyst, 6-182; magnesium, 5-81.

Catamaran. A sailing craft, 1-502.

Catania [katah'nia]. It. Spt. on E. coast of Sicily near Mt. Etna; pop. 300,298, 4-304; eruptions of Mt. Etna, 3-303.

Catapult. Roman engine of war, 6-132 illus.

Cataracts, on r. Nile, 5-110.

Catch-as-catch-can wrestling, 7-501-502.

Catchfly. Plant, type of campion, 2-191.

Cateau-Cambrésis, Treaty of (1559), and Span. rule in Italy, 4-314.

Catenary [katén'ari]. Curve assumed by a flexible rope or chain hanging naturally between two points; such curves, inverted, may be used as models for arches.

Catering, as a career, 2-231.

Caterpillar. Larvae of moths and butterflies, 2-263, 2-136, 4-148; of swallowtail butterfly, 2-137 illus.

Caterpillar track, 7-304; on tanks, 7-222.

Catesby, Robert (1537-1605). One of the chief "Gunpowder Plot" (Nov. 5, 1605) conspirators; fled on discovery of plot and was shot dead by his pursuers.

Catfish. Smooth-skinned scaleless fish of N. Sea and Atlantic, 2-264.

Cathay. Name used in Middle Ages for regions in Far East, 2-368.

Cathedral. Principal church of a diocese containing the seat or chair of the bishop or archbishop, 2-264, 2-265, 272 illus.; architecture, 1-210; Alexander Nevsky cath., 7-81 illus.; Burgos, 7-113 illus.; Chichester, 2-335 illus.; Lichfield, 4-191; Liverpool, 5-521 illus.; Milan, 5-205, 204 illus.; Norwich, 5-467 illus.; Notre Dame, Paris, 6-81 illus.; Peterborough, 6-116, 5-156 illus.; Reims, 6-379 illus.; Santiago de Compostela, 7-106 illus.; Segovia, 7-109 illus.; Seville, 7-5; St. Mark, Venice, 7-387; St. Stephen, Vienna, 7-398, 399 illus.; Uppsala, 7-203 illus. f.; Utrecht, 7-372 with illus.; Wells, 7-439; Winchester, 7-457.

Cather, Willa Sibert (1876-1917). Amer. novelist. Works include *I Last Lady* (1923); *I Cath Comes to the Arch-bishop* (1927); *Shadows on the Road* (1931), 7-365.

Catherine (of Alexandria), St. (4th cent. A.D.). Virgin martyr, tortured on a toothed or "Catherine" wheel, patroness of scholars, theologians and virgins.

Catherine (of Siena), St. (1347-80). It. ascetic and mystic, a dyer's daughter, persuaded Pope Gregory XI to return from Avignon to Rome.

Catherine I (1683-1727). Empress of Russia, wife and successor of Peter the Great (1725), 6-146.

Catherine II, the Great (1729-96). Empress of Russia; murdered her husband Peter III and seized his throne, 6-474; foundation of Odessa, 5-500.

Catherine (of Aragon) (1485-1536), daughter of Ferdinand and Isabella of Spain, and first queen of Henry VIII of Eng.; divorce, 4-163, 2-526, and Mary, 5-140.

Catherine (of Braganza) (1638-1705), wife of Charles II; marriage and Bombay in dowry, 2-308, 4-252, 1-515.

Catherine de' Medici (1519-89). Queen of Henry II of France; made regent on accession of boy-king Charles IX and sided with Guises against Huguenots 3-450; and Coligny, 2-453.

Catherine Howard (c. 1522-42). 5th queen of Henry VIII of England, 4-164.

CATHERINE PARR

Catherine Parr (1512-48). 8th and last queen of Henry VIII of Eng., tactful, kindly woman to whose influence her stepchildren, the future sovereigns Edward VI, Mary I. and Elizabeth I, owed much; 4-164.

Cathode. In electricity, the electrode or point through which a direct current leaves a liquid or gas; as in a cell or thermionic valve, 7-376; in electronic control devices, 3-222; in X-ray tube, 7-507 illus.

Cathode Rays, 7-507 with illus.

Cathode Ray Tube. Apparatus consisting of an electron gun producing a beam of electrons which passes through horizontal and vertical plates to fall upon a fluorescent screen. The whole is enclosed in an evacuated glass envelope, one end of which is coated with a fluorescent material and acts as the screen. The point at which the electrons strike the screen can be seen by the fluorescence produced by them. Electric currents applied to the deflecting plates cause a deflection of the electron beam. In radar receiver, 6-337; in calculating machines, 2-177 illus.; in television, 7-252.

Catholic Emancipation. Movement in U.K. which secured for Roman Catholics almost the same privileges as Protestants; O'Connell and, 5-199; Peel and, 6-105.

Catiline, or **Lucius Sergius Catilina** (c. 108-62 B.C.). Rom. politician who conspired to murder the consuls, plunder the treasury, and set Rome on fire; Cicero's in. cent. of, 2-387.

Cations (kat'ions). Ions in an electrolyte which carry the positive charge and which migrate towards the cathode under the influence of and in the direction of a potential difference of current, 4-278.

Catkin. In botany a form of unisexual inflorescence; of alder, 1-97 with illus.; hazel, 4-143; hornbeam, 4-195; willow, 7-451 illus.

Cato, Marcus Porcius (234-149 B.C.). Roman statesman, called Cato the Censor, 2-273; and Carthage, 2-255; as historian, 4-450; and salting of ham, 1-311.

Cato Street Conspiracy. Political plot to kill Lord Castlereagh and other members of Cabinet, Feb. 23, 1820; conspirators hanged or transported.

Cats' cradle, in New Guinea, 2-336 illus.

Cat's-eye. A form of quartz, greenish-gold in colour; it is a semi-precious stone used in jewelry, 6-320.

Catskill Mts. Part of the Appalachian Mts., U.S.A., 1-185, 5-121.

Cattalo. Experimental animal, part bison and part cattle, bred in Canada, 1-176.

Cattaro (Yugoslavia). See **Kotor**.

Cattegat. See **Kattegat**.

Cattermole, George (1800-68). Notable Eng. water-colour artist; illustrator of Scott's Waverley Novels, and several of Shakespeare's plays.

Cattle, 2-273; in Argentina, 1-223; the 'Collings' work on breeding, 1-78; composition of horns, 4-194; dairy-farming, 3-26.

Cattle food, types in dairy farming, 3-26; oil cake, 3-388.

Catullus (kat'ulus). Gaius Valerius (c. 84-54 B.C.), Roman poet, 4-150.

Cauca, R. of S. Amer., tributary of the Magdalena, 2-457.

Caucasia. Region between Black and Caspian Seas, 2-274.

Caucasiforms. Name sometimes given to a division of the human species. Now often called Eurasiatics (q.v.).

Caucasus (kaw'kasus), Mt., in Gk. myth., scene of Prometheus' punishment.

Caucasus Mts., range between S.E. Europe and Asia; extending from Sea of Azov to Caspian Sea; in 2nd World War, 7-491.

Caudillo. Title assumed by Gen. Franco as leader of Sp. govt. in 1939.

Caudine Forks. Mt. pass in Samnium, 25 m. N.E. of Naples, where 40,000

Romans surrendered (321 B.C.) in 2nd Samnite War.

Cauliflower. Vegetable of cabbage type, introduced into Gt. Brit. from Mediterranean countries, 2-151.

Caustic potash. Chemical used in soap making, 1-112, 7-80.

Caustic soda. Chemical, 1-112, 1-12, 7-80.

Cauterets. Spa in Fr. Pyrenees, 6-314.

Cauto, riv. of Cuba, 250 m. long, 3-6.

Cauvery, riv. of Madras, India, 5-69.

Cavalleri, Emilio de' (c. 1550-1602). It. musician and composer, 5-513.

Cavaliers. Royalists in Eng. Civil War; costume, 2-421; hats worn by, 4-137.

Cavalleria Rusticana. Opera by Mascagni, 5-515 illus.; story, 5-516.

Cavalli, Francesco (1602-76). It. composer, pupil of Monteverdi, 5-513.

Cavallo, Tiberio (1749-1809). It. chemist; and hydrogen balloon theory, 1-353.

Cavalry. British regiments, 1-250; armour, 1-243, 244; in Roman army, 1-246.

Cavan. Co. of Irish Rep. Area 730 sq. m., pop. 71,666. Chief rivers are the Erne and the Blackwater. Agriculture and distilling are main industries. Cavan is co. tn.; pop. 3,056; 4-284.

Cave, 2-276; cave-paintings, 2-282, 283 illus.; cave-dwellers, 2-282; in Pyrenees, 6-313.

Cave drawings, 2-279 illus.

Cave-dwellers, of the Stone Age, 2-282; social life, 5-108; paintings and drawings by, 5-78, 2-279 illus.; 5-104, 105 illus. f., 5-108, 109 illus. f.

Cavell', Edith Louisa (1865-1915). Brit. nurse, matron of a Brussels hospital, shot by Germans for helping Allied soldiers to escape into Holland. Oct. 12, 1915; buried, 1919, in Norwich Cathedral; memorial in St. Martin's Place, London; her last recorded words: "I realize that patriotism is not enough."

Cave Newt. See **Proteus**.

Cavendish. Family name of the dukes of Devonshire.

Cavendish, Lord Frederick Charles (1836-82). Brit. politician; shortly after appointment as Chief Secretary for Ire. in 1882 was murdered in Phoenix Park, Dublin.

Cavendish, Henry (1731-1810). Eng. chemist and physicist, 2-283; and phlogiston theory, 2-317.

Cavendish Laboratory, Cambridge; named after Henry Cavendish; estab. 1868; planned by Maxwell, 5-150.

Cavendish Professorship, in Experimental Physics, Cambridge Univ.; foundation and professors, 2-283.

Caviare (kav-i ah'r'). A preparation of sturgeon roe, 7-174.

Cavour, Count Camillo Benso di (1810-61). It. statesman, guided Piedmontese policy in breaking Austrian power in It. and unifying the country. A constitutional monarchist, he opposed Mazzini's republicanism, but used Mazzini's and Garibaldi's movements when expedient; he won Fr. and Eng. support, and at his death most of Italy was united under house of Savoy; 3-504, 4-316, 6-499.

Cavy. (Zool. family of rodents): guinea-pig, 4-105.

Cawdor. Tn. in Nairnshire, Scot.; pop. 823; here Macbeth slew King Duncan in 1040, 5-314.

Cawnpore or Kanpur. Industrial city of Uttar Pradesh, India, on r. Ganges; pop. 1,000,000.

Caxton, William (1422?-1491). First Eng. printer, 2-283; printing press at Westminster, 6-289, 3-168 illus.; as translator, 3-284; *The Game and Play of Chess*, 2-3 illus.

Cayenne, Cap. of Fr. Guiana, S. Amer.; pop. 11,704; formerly Fr. penal settlement, 4-103.

Cayenne canary. Canary with reddish feathers.

Cayenne pepper, 6-121.

Cayley, Sir George (1773-1857). Eng. aeronautical pioneer, 1-31, 32.

CELTIC LANGUAGES

Cayman Islands. Three small coral isls. of the Brit. W. Indies, 200 m. N.W. of Jamaica, 93 sq. m.; pop. 6,700 as dependency of Jamaica, 4-338.

Cavagaa. Amer. Indian tribe, 5-421.

Cebu. Tn. on Cebu Isl., Philippine Isls.; pop. 167,503, 6-156.

Cecil. Great Eng. family, 2-284; see also five following entries.

Cecil of Chelwood, **Robert Cecil**, 1st Viscount (b. 1604). Brit. statesman, 2-285. (reated C.H. 1956).

Cecil, Lord (Edward Christian) **David** (Gascoyne) (b. 1902). Brit. writer and professor, 2-285, 523 C.H. 1919.

Cecil, Robert. See **Salisbury**, Earl of.

Cecil, Thomas, Earl of **Exeter**. See **Exeter**, Earl of.

Cecil, William. See **Burghley**, Lord.

Cecil'ia, St. Christian martyr, supposed to have perished in Sicily about A.D. 180; patron saint of musicians; festival celebrated on Nov. 22.

Georgos (sk'rops). Mythical founder of Athens and first king of Attica; represented as half man, half dragon.

Cedar. Cone-bearing evergreen tree, 2-285; cone of cedar of Lebanon, 2-483 illus.

Cedar Run, Battle of (1862), in Amer. Civil War, 4-175.

Cedron. See **Kidron**.

Ceiling. See **Nautical Terms and Aeronautics** (lists).

Celandine (sel'and'in). Derived from Lat. *chelandium*, Gk. *chellon*, swallow; the lesser celandine (*Ranunculus ficaria*), a member of the buttercup family, has starry yellow flowers; roots, 1-151; The much less common greater celandine (*Chelidonium majus*) is no relation, being a kind of poppy with soft, hairy leaves; this grows in old walls; both are supposed to flower with the arrival of swallows.

Celebes (sel'eb'ez). Isl. of Indonesia; area 39,000 sq. m. (with dependent isls. 73,000 sq. m.); pop. 4,230,000, 2-286.

Celeriac. Variety of celery, 2-286.

Celery. Vegetable, 2-286.

Celeste or Celesta. Percussion instrument, played with a keyboard, 5-307.

Celibacy, among R.C. clergy, 6-426.

Cell. In living organisms, 2-286, 3-240; in human body, 6-189; in transmission of life, 1-448; brain cells, 2-40; protoplasm in, 6-297; rod and cone cells of eye, 3-332; plant cells and cellulose, 2-24, 2-287; X ray effect on, 7-507; in yeast, 7-512-513.

Cell. Source of electrical energy produced by chemical reaction between two dissimilar metals (or between a metal and carbon) both separately in contact with an electrolyte; 1-386, 2-219.

Celliers, Jan Franz Elias (1865-1910). S. African writer, 1-66.

Cellini (chell'i'ne). Benvenuto (1500-71). It. goldsmith and sculptor, 4-320, 6-386; his aid to memory, 5-168; *Perseus*, 6-128 illus.; salt cellar of Francis I., 4-328 illus.

Cello (chell'o). Abbrev. of violoncello. A stringed musical instrument, 5-307, 7-402.

"Cellophane". A transparent product of a sodium compound and cellulose, extensively used as a wrapping, 6-369, 2-288.

Celluloid. A plastic, 2-287, 6-219.

Cellulose. A carbohydrate; substance out of which cell walls of plants are made, 2-287; rayon from, 6-368.

Cellulose, lacquer. Substance with a quick-drying finish, 4-435.

Cellulose xanthate, in rayon mfr., 6-369.

Celsius (sel'sius), **Anders** (1701-44). Swedish astronomer; devised Centigrade ("Celsius") thermometer.

Celsus (1st cent. A.D.). Rom. nobleman; wrote medical encyclopedia about A.D. 30, 5-161.

Celtic. Glasgow football club, 4-29.

Celtic languages and literature, 4-445; Arthurian legends, 1-266; words in English, 3-281.

CELTIS

Celts. People of w. Europe, 2-233; migration of, 5-204; anc. agriculture, 1-73; celtic crosses, 2-535; enamel work, 2-244 illus.

Cement. 2-233; and concrete, 2-476; cement punning, 2-478; from magnesite, 5-81.

Cenis. Mt. and pass of Alps on border of Fr. and It. Main pass reaches 6,893 ft. Famous rly. tunnel is 7 1/2 m. long; tunnel construction, 6-230.

Cenotaph. Word derived from *Gk. kenos*, empty, and *taphos*, tomb. Usually a monument to persons whose graves are unknown or who are buried elsewhere. The Cenotaph in Whitehall, London, commemorates all Commonwealth servicemen and women killed in 1st and 2nd World Wars, 5-23.

Censors. Officials in the Rom. Empire; duties, 2-405.

Census. Enumeration of the population, 2-291; counting by punched card machines, 2-169.

Cent. A coin of the U.S.A., weighing 48 grains (95 per cent. copper, 5 per cent. tin and zinc) and valued at the hundredth part of a dollar, first issued in 1787.

Cental. Measure of weight, equal to 110 lb. avoirdupois, chiefly used in weighing grain.

Centaur (sen'tawr). Legendary monster, half man, half horse, 2-291.

Centaur beetle. Tropical beetle, 1-115.

Centaurus. A southern constellation; brightest star, Alpha Centauri.

Centavo. See Money (table).

Centesimo. See Money (table).

Centigrade scale of temperature. 7-267 with illus.

Centigram. Unit in metric system (0.164 grains).

Centilire. Unit in metric system (0.338 fluid oz.).

Centime. Former Fr. coin, 100th part of a franc. Not minted after July 1950.

Centimetre. Unit in metric system (0.3937 in.).

Centimetre-gram-second (C.G.S.). System of units based on the length of the centimetre, the mass of the gram, and the time of the second. Used in electrical engineering and in physics.

Centimo. See Money (table).

Centipedes. A type of many legged arthropod, 2-291, 1-151.

Centistere. See Decalitre.

Central America. Includes Guatemala, Salvador, Nicaragua, Honduras, Costa Rica, Panama, and British Honduras; area 220,440 sq. m.; pop. 8,881,093, 2-291.

Central Criminal Court, London. See Old Bailey.

Central heating. types of, 4-150, 149 diag. f.

Central Massif. Mountainous tableland in Fr.; almost the whole is above 1,000 ft.; numerous summits over 5,000 ft., 3-434.

Central Provinces and Berar. Former Brit. province in India, now known as the Madhya Union, 4-211.

Centre-board. See Nautical Terms.

Centre of Gravity. defined, 4-87.

Centrifugal fan. 3-340.

Centrifugal Force. 2-293; in laundries, 4-455.

Centrifugal pump. 6-307.

Centrifuge. Rotating apparatus used to separate heavier from lighter liquids, etc., 2-294.

Centripetal force. Force operating on a body moving in a curve, tending to draw the body to the centre.

Centroseome. Part of a living cell, 1-449 illus.; 2-286 diag.

Centurion. Army officer of anc. Rome, originally a commander of 100 men, 1-246 with illus.

Century. Unit of Roman army, 1-246.

Century plant. See American aloe.

Cephalaria (sefal'ala). Mountainous Gk. isl. w. of mainland; second largest of Ionian group; 260 sq. m.; pop. 72,140; suffered severe earthquakes 1953.

Cephalopoda. A class of molluscs, including cuttlefish, squid and octo-

pus, 3-12, 5-232; water jet propulsion, 4-370.

Cepheus (se'fies). In Gk. myth., king of Ethiopians, father of Andromeda; Cassiopeia was his queen.

Ceram (seram'). Second largest isl. in Moluccas, Indonesia, w. of New Guinea; 6,825 sq. m.; pop. 98,744; mountainous, thick forests; vago palm, agricultural products, etc.

Ceramics. The plastic arts of the potter and clay-worker; types of, 6-276.

Cerberus. In Gk. myth. three-headed dog, guardian of the entrance to the underworld; Hercules and, 4-166.

Cereals. Any grass yielding farinaceous seeds suitable for food, such as wheat, maize, rice, etc.; rust fungus, 6-181; starch in, 7-149.

Cerebellum. Smaller brain at back of skull controlling reflex actions, 2-40.

Cerebrum. Largest and principal part of the brain, 2-40.

Ceres. In Rom. myth., goddess of agriculture; identified with Gk. Demeter; harvest festival, 4-134.

Cereus. A variety of cactus, 2-157.

Cerigo. Southernmost Gk. isl. of Ionian group, 40 m. s.w. of Mainland; 116 sq. m.; anc. Cythera, sacred to Aphrodite.

Cerium (se). Chem. element; atomic no. 58; atomic weight 140.13; 3-224.

Cernauli (formerly Czernowitz). City in Bukovina on r. Prut; with rest of Bukovina annexed to the Ukraine in 1910.

Cerro del Mercado. Mexico, iron deposits, 5-187.

Cerro de Pasco. Peru; copper mines, 5-141.

Cervantes Saavedra, Miguel de (1547-1616). Span. writer, author of *Don Quixote*, 2-294; 5-471, 7-121.

Cesarewitch The. Horse race run over a 2 1/2 m. course at Newmarket, Eng., on the Wednesday of the second October meeting.

Cesky (ches'ke). Slav people who gave their name to Czechoslovakia, 1-503.

Cetacea. Order of mammals including true whales, dolphin, narwhal, porpoise, 5-103, 7-445.

Cetewayo (se). 1836-84). King of the Zulus. In Zulu war of 1879, following annexation of the Transvaal, he was captured and brought to Eng., where he won so much sympathy that he was restored to kingship in 1883; 7-91, 527.

Cetinje or Titograd. Tn. in Yugoslavia; pop. 6,400; former cap. of Montenegro, 5-250.

Cette (set). Fr. spt. on s. coast; pop. 35,400; trade in wine, salt, fish.

Cetyl alcohol. formula, 1-96.

Ceuta (se'ta). Morocco. Span. port, military station, and penal settlement on n. coast opposite Gibraltar; pop. 39,115; long a Moorish stronghold.

Cevennes (saven') Mts. Chief range in s. Fr. extending N.E. to s.w., W. of r. Rhone.

Ceylon. Isl. s.e. of India; Dom. of Brit. Commonwealth; pop. 7,000,000; area 25,481 sq. m.; 2-297, 2-84; rubber trees, 1-272; tea plantation, 7-233 illus.; flag, 3-384 illus. f.

Cézanne, Paul (1839-1906). Fr. landscape and figure painter, 2-298, 3-449; river scene, 3-447 illus.

Chablis. Tn. of Fr. in dept. of Yonne. Produces a dry white wine bearing the town's name. Pop. 1,890.

Chacma baboon. Native to S. Africa; intelligence of, 5-242.

Chaco, El Gran. See Gran Chaco.

Chad. Territory of French Equatorial Africa; cap. Fort Lamy, 2-482.

Chad Lake. Chad territory, French Equatorial Africa, area 10,000 sq. m.

Chadwick, Sir Edwin (1800-90). Brit. reformer; did much to further cause of public sanitation; and preventive medicine, 5-165.

Chadwick, Sir James (b. 1891). Brit. physicist; during research on atomic energy discovered the neutron; shared in the experiments that led to the atom bomb.

CHAMBERLAIN

Chaeronea (kérone'a). Anc. tn. in Boeotia; birthplace of Plutarch; battle of (338 B.C.), 1-98, 4-77, 7-267.

Chaetodon ephippium. Tropical fish, 5-128 illus. f.

Chaetopods (ké'topods). Sub-class of annelid worms with bristles.

Chafers. An immense family of beetles, including scarab group, cockchafer, rose chafer, leaf chafer.

Chaffinch. Bird of the finch family, 3-352; migratory habits, 1-456; egg, 1-452 illus. f.; wing, 3-344 illus.

Chagall, Marc (b. 1887). Russ. painter, at first cubist and surrealist, later attacked modernistic art; it was of his and 'Chirco's paintings that the word "surreal" was first used.

Chagres (chah'grus) River. Flows across Isthmus of Panama into Caribbean Sea; supplied water for locks of Panama Canal; dammed to form Gatun Lake, 6-58.

Chain. Unit of measurement in surveying (22 yds.).

Chain, Ernest Boris (b. 1904). Anglo-Ir. bio-chemist; worked with Prof. Florey in isolating penicillin; with Florey and Fleming received Nobel prize in 1945; 1-174.

Chained Bible. in Old St. Paul's, 1-442 illus.

Chain-mail. in armour, 1-243.

Chain reaction. In nuclear fission 1-300 with diag.

Chair. Article of furniture; importance in Middle Ages, 3-190; 18th cent styles, 3-193 illus.

Chaise. Light two-wheeled or four wheeled vehicle, drawn usually by one horse. Drawn by two or four horses became the chief vehicle for posting, hence post-chaise, 6-411.

Chaka (1783-1829). Zulu chief, and Dingaan, 7-327.

Chalcedon (kalsé'don). Anc. spt. in Asia Minor on Bosphorus, opposite Byzantium; Kadikol now occupies site; 4th council of Christian Church held here in A.D. 451.

Chalcedony. A coloured variety of quartz, blue or grey; used in jewellery, 6-320, 7-166. See also Stones, Precious (list).

Chalcedice (kal'sid'se). Anc. name of peninsula in N.W. Greece with a smaller peninsula projecting into Aegean Sea.

Chaldean. Biblical name for a region on the Euphrates-Tigris plain. Under the Chaldean empire, the name Chaldaea was given to the plain of N. and S. Babylonia; conquest of Babylonia (612 B.C.), 1-338.

Chalfont St. Giles. Village in Bucks, Eng.; Milton's cottage, 2-105, 5-210 illus.

Chalgrave Field, Battle of. In Oxfordshire (1613); Royalist under Prince Rupert defeated Parl. army; death of John Hampden, 4-123.

Chalilapin (shal'yapén). Feodor (1873-1938). Celebrated Russian bass opera singer; his most memorable achievement was the name part in opera *Boris Godunov*.

Chalk. A soft limestone, 2-299, 4-510; in cement mfr., 2-290; how formed, 5-127; sheds in, 7-24 lime from, 4-508.

Chalk Hill Blue butterfly. 2-141 illus.

Challenger Expedition. Famous Brit. expedition to study physical and biological conditions in deep sea (1872-76); results fill 40 vols.

Chalmers, Thomas (1780-1847). Scot. preacher and political economist, one of chief promoters of Free Church of Scotland.

Châlons-sur-Marne (shah'awn sú mahrn'). City in N.E. Fr.; pop. 32,300; exports champagne; taken by Germans 1870, 1914 and 1940; traditional site of famous battle of A.D. 451; 4-208.

Chalon-sur-Saône. Fr. city 80 m. N. of Lyons on r. Saône; pop. 32,530; iron mfrs.; large ordnance works.

Chamberlain. Brit. political family. See entries Chamberlain, Joseph, etc., 2-299.

CHAMBERLAIN

Chamberlain, Sir (Joseph) Austen (1863-1937). Brit. statesman, elder son of Joseph Chamberlain, 2-300, 4-464.

Chamberlain, Houston Stewart (1855-1927). Brit. political writer, naturalised German, 1916. Wrote on Wagner, Kant, Goethe; chief work, *Foundations of the Nineteenth Century*.

Chamberlain, Joseph (1836-1914). Brit. statesman, 2-299, 1-474, 3-12.

Chamberlain (Arthur), Neville (1869-1940). Brit. statesman, younger son of Joseph Chamberlain, 2-300; and "Munich agreement," 7-486 with illus.; and Anthony Eden, 3-162.

Chamber music, defined, 5-305.

Chambers, Ephraim (1680-1740). Eng. encyclopaedist, 3-245.

Chambers's Encyclopedia, 3-245.

Chambery, Fr. Historic tn. 55 m. s.e. of Lyons; pop. 29,980; cap. former duchy of Savoy.

Chambesi, R. of Africa rising in highlands s. of Tanganyika and flowing n.w. to Lake Bangweulu, 6-395.

Chameleon. Type of lizard, 2-301, 4-530; protective coloration, 6-296, eye, 3-333 illus.

Chaminade (shamnuhnd), Cécile Louise Stephanie (1861-1944). Fr. pianist and composer.

Chamisso, Adelbert von (1781-1838). Ger. writer and botanist; wrote ballads and romances, 4-13.

Chamois (shamvuh). Animal related to antelopes and goats, 2-301, 1-171.

Chamois leather, 4-469, 4-35.

Chamonix (shamóné). Beautiful valley and village in n.e. Fr. at foot of Mont Blanc, 1-126, 125 illus.

Champagne. Former prov. of n.e. Fr.; chief city, Troyes; Champagne wine is usually a white sparkling wine produced in the Marne dept.; best is made from small black grapes, 3-436.

Champagne, Philippe de (1602-74). Fr. painter; portrait of Richelieu, 3-441 illus.

Champlain, Samuel de (1567-1635). Fr. explorer and founder of Quebec (1608), 2-199, 1-136; settlements on St. Lawrence, 6-487; discovery of L. Huron, 4-69; founded Quebec, 6-321; and the sunflower, 7-190.

Champlain, Lake. Between Vermont and New York, U.S.A., discovered by Champlain; length 110 m.

Champlevé. Enamel technique, 3-244.

Champollion (shahnpolyon), Jean François (1790-1832). Fr. scholar, founder of Egyptology; deciphered the Rosetta Stone, 6-455, 3-183.

Champs Elysées (shahnzhé), Avenue des. Famous thoroughfare in Paris, 6-80 illus.

Chancellor. Title given to high state officials in many countries, e.g. in U.K. Brit., Chancellor of the Exchequer, Chancellor of the Duchy of Lancaster, Lord Chancellor; chancellor of university in the U.K. is its official head; of cathedral, 2-273.

Chancellorsville, battle of (1863). The Federal forces under Hooker were defeated by the Confederates led by Lee; Stonewall Jackson was mortally wounded, 4-334, 4-475.

Chancery Division, of the High Court, 2-521.

Chandernagore. Former prov. of Fr. India on r. Hooghly, 22 m. above Calcutta; since June 1949 a part of the Indian Union; 3 sq. m.; pop. 38,284.

Chandigarh. New cap. of Punjab, India, replacing Lahore as admin. cap. Built by Le Corbusier and Maxwell Fry, 4-240, 4-474.

Chandi Chauk (silver street). Famous thoroughfare in Delhi, India, 3-86, 67 illus.

Chandragupta. Indian king, grandfather of Asoka; defeat of Seleucus Nicator (305 B.C.), 4-261.

Changchun. Tn. in Manchuria; pop. (1930) 415,264, 5-112.

Changellings, in folk lore, 3-338.

Chang-ringing, of bells, 1-425 with illus.

Changkangsal. Mt. range on eastern side of Manchurian plain, 6-112.

Changsha, China. City 350 m. n. of Canton on Hsiang r.; cap. Hunan prov.; pop. 606,972; silk mfrs.; matches; tinplate; trade in timber.

Channel, English. See English Channel.

Channel Islands. Jersey, Guernsey, Alderney, Sark, with smaller islands; total area 75 sq. m.; pop. 102,776, 2-302, 2-151.

Channel swimmers, 7-210.

Channel Tunnel. Submarine tunnel to connect Eng. and Fr., originally projected by M. Mathieu to Napoleon I; a beginning was made in 1876 at Dover and at Sangatte, near Calais; mooted many times since. Chant. See Musical Terms (table).

Chantilly (shant'yè), Fr. Anc. tn. 20 m. n. of Paris; splendid château; art collection; once noted for Chantilly lace; famous race-course.

Chantilly lace, 4-432.

Chantry (chahnt'ri), Sir Francis Legatt (1781-1841). Brit. sculptor. The bulk of his fortune, forming the Chantry Bequest, was bequeathed to the trustees of the British Museum for the furtherance of the fine arts; first exhibition of the entire collection held by R.A. in 1949; 7-229.

Chanute (shan-ewt), Octave (1832-1910). Fr.-Amer. aeronaut; experimented with gliders from 1890, writing on the theory of flight, and helped the Wright bros. in their early work on aeroplanes; 4-33. A city in Kansas is named after him.

Chaplin, Charles Spencer (Charlie). British film actor and director, 2-303; in *The Gold Rush*, 2-397.

Chapman, George (c. 1559-1634). Eng. poet and dramatist. Chiefly remembered for his translation of Homer. As dramatist, collaborated with Marlowe and Jonson.

Chappe silk. Variety of silk produced in Fr.; made from waste silk, 7-54.

Chapter House. Building attached to a cathedral or monastic house, where dean and chapter or abbot and monks conduct their business.

Charade. Game, 2-304.

Charcoal, 2-305; as fuel, 3-486; from lime wood, 4-509; used in iron smelting, 4-293.

Charcot (shahr'kô), Jean Baptiste (1867-1936). Fr. Antarctic explorer; led expeditions in 1903 and 1908; mapped Graham Land, Alexander Land, etc.; Charcot Land named after him.

Charcot, Jean Martin (1825-93). Fr. physician; one of the first to employ hypnosis to treat mental disorders.

Chardin (shahrdan), Jean Siméon (1699-1779). French artist, 3-439, 6-34; "La Mere Laborieuse," 3-445 illus.

Chardonnet (shahr'doné), Hilaire de. Count (1840-1924), French chemist; inventor of the nitrate process of making rayon, 6-368.

Charge, in heraldry, 4-165, 164 illus. f.

Charge. The quantity of electricity on a body (e.g., the plates of a capacitor), caused by an excess or deficiency of negative electrons. Also the amount of electricity in a storage battery; hence the term "charging" -- to restore to a storage battery its maximum current.

Chargé d'affaires. Diplomatic agent acting as deputy to an ambassador or representing his country at a court of minor importance, 1-131.

Charing Cross. Rly. station, etc., in London on site of former village of Cheringo, where Edward I erected great cross in memory of his queen Eleanor; replica of cross, 2-535, 5-28 illus.

Chariot, Roman, 6-438 illus.

Charioteer (constellation). See Auriga.

Chariot racing, in ancient Rome, 2-403.

Charity. Sisters of. Name of several Rom. Cath. orders and branches of orders, whose members are devoted to care and education of sick and poor; oldest order founded in Paris in 1633 by St. Vincent de Paul.

Charlemagne (shahr'lemán), (742-814). King of the Franks and Holy Rom. emperor, 2-306, 2-449, 5-199;

CHARLES

coronation, 3-450 illus.; uniting of Ger. tribes, 4-5; overthrow of Lombards, 5-19, 4-306; division of empire, 1-417; height of, 4-17; tomb at Aachen, 1-1.

Charleroi (shahr'lrwah), Belgium, rly. and iron-mining centre, 30 m. s. of Brussels; pop. 28,200.

Charles I. Holy Rom. emperor and king of Fr. See Charlemagne.

Charles II, The Bald (832-877). Holy Rom. emperor and king of Fr., 2-308.

Charles III, the Fat (823-88). Holy Rom. emperor and king of r. Franks, 882; king of w. Franks also, 884; deposed, 887.

Charles IV (1316-78). Holy Rom. emp. (1347) and Charles I, King of Bohemia (1316); and Prague Univ., 1-303; creation of electoral college, 4-188; Golden Bull (1356), 4-8.

Charles V (1500-58). Holy Rom. emperor 1519-56, and king of Spain, the greatest monarch of 16th cent. Europe, mainstay of Catholic cause against Reformation in Germany; retired to monastery and divided his realms between his brother Ferdinand (empire) and son Philip II (Spain); 4-8; 3-314; 7-105; 7-454; as a Hapsburg, 4-129; and Luther, 5-53; defeat of Francis I (1526), 4-314; and Malta, 5-98; portrait, 4-129.

Charles VI (1685-1740). Holy Rom. emperor (1711), 1-326; portrait, 4-129.

Charles VII (1697-1745). Holy Rom. emperor (1742) and elector of Bavaria. Chosen emperor in opposition to Maria Theresa's husband, Francis I. Was defeated and fled to Bavaria in war that followed.

Charles I (1887-1922). Emperor of Austria-Hungary 1916-18, succeeded Francis Joseph; abdicated on collapse of Central Powers; exiled to Madeira, 4-130.

Charles I (of Bohemia). See Charles IV (Holy Rom. emp.).

Charles I (1600-49). King of Eng. and Scot., 2-306, 2-278, 7-150, 504 illus.; and archbishop Laud, 4-453; and Strafford, 7-170; and Villiers, 2-103; and Scot. religion, 6-512; Harvey as physician to, 4-135; in House of Lords, 3-279 illus.; and horse racing, 5-399; as art connoisseur, 4-125; beard, 1-398 illus.; and yachting, 7-509.

Charles II (1630-85). King of Eng. and Scot., 2-307, 3-278, 280; return from exile, 3-279 illus.; colonising in Carolina, 2-245; and Pennsylvania, 6-120; and Royal Society, 6-463; and Scotland, 6-512; and St. James's Park, 3-132; Oak Apple day, 5-489; and horse racing, 5-399, 4-198; and football, 3-414; statue by Gibbons, 4-19.

Charles III, the Simple (879-929). King of Fr., 2-308.

Charles IV, the Fair (1294-1328). King of Fr., youngest son of Philip IV; succeeded brother Philip V as king of Fr. and Navarre, 2-308.

Charles V, the Wise (1537-80). King of Fr., 2-308.

Charles VI, the Well-Beloved (1368-1422). King of Fr., 2-308.

Charles VII (1403-61). King of Fr., 2-308; 3-450; in Hundred Years War, 4-204; and Joan of Arc, 4-376.

Charles VIII (1470-98). King of Fr., 2-309; claim to throne of Naples, 4-313; Italian wars, 2-314; alliance with Pope Alexander VI, 2-17.

Charles IX (1550-74). King of France, 2-309; and Coligny, 2-453.

Charles X (1757-1836). King of Fr., 2-309; Lafayette and, 4-437; in Bourbon family, 2-28.

Charles (King of Rumania). See Carol.

Charles II (1661-1700). King of Spain; portrait, 4-129.

Charles III (1716-1788). King of Spain and Naples; and Neapolitan succession, 2-28.

Charles XII (1682-1718). King of Sweden (1697); carried on Ot. Nordic War (1700-21) against Denmark and allies, at first with success; defeated at Poltava (1709) by Peter

CHARLES

the Gt.; escaped to Turkey (1709-14); killed at Fredrikshald; 6-146.
Charles XIV (1763-1844), Sweden. *See* Bernadotte, Jean Baptiste Jules.
Charles, Duke of Cornwall (b. 1948), Brit. prince, son of Elizabeth II and the Duke of Edinburgh, born Nov. 14, 1948, at Buckingham Palace. Full names, Charles Philip Arthur George.
Charles (b. 1903). Belgian prince, brother of Leopold III; joined Resistance forces while Leopold was in Ger. hands; prince-regent, Sept. 1944 to July 1950.
Charles (the Bold), Duke of Burgundy (1433-77), 3-387; tomb, 2-97; and Louis XI, 5-41.
Charles (the Young Pretender). *See* Charles Edward.
Charles, Jacques Alexandre César (1746-1823), Fr. physicist; Charles's law, 3-508 510; hydrogen balloon, 1-353.
Charles Albert (1798-1849), king of Sardinia; succeeded 1831; began struggle for it. independence.
Charles Edward (1720-88), "the Young Pretender"; 1745 rebellion, 4-334 with illus.; and Flora Macdonald, 5-61.
Charles Martel (c. 690-741). Frankish ruler and mayor of the palace to Clothaire IV, 2-309, 5-199.
Charles River, Mass., U.S.A., length 86 m.; flows into Boston Harbour, 6-145.
Charles Ross. Dessert apple, 1-186 illus. f.
Charles's Wain (constellation). *See* Plough.
Charleston, South Carolina, U.S.A. Most important harbour of s.e. U.S.A.; pop. 70,174; 2-244.
Charleston. Cap. of W. Virginia, U.S.A.; pop. 73,501, 7-403.
Charleys. Watchmen who patrolled the streets before the London police force was organized, 6-217.
Charlock. Wild plant; seeds as substitute for mustard, 6-312.
Charlotte (1744-1818). Queen of George III of Gt. Brit., whom she married 1761. She was a princess of Mecklenburg-Strelitz.
Charlotte (1796-1817). Daughter of George IV of Gt. Brit. and wife of Leopold I of Belgium, 4-484.
Charlotte, grand duchess of Luxembourg (b. 1896), succeeded 1919, on abdication of sister; escaped to England May 1940; returned April 1945.
Charlottetown. Cap. of Prince Edward Island, Canada; pop. 15,887, 6-288.
Charm. An incantation or object believed to bring good luck; and superstition, 5-78.
Charnock Job (d. 1893). Founder of Calcutta; first settlement at Calcutta (1690), 2-172.
Charnwood Forest, Leics, Eng. Barron hill dist. 20 sq. m. in area; Barron Hill (912 ft.) highest point, 4-476.
Charon (kah'ron). In Gk. myth., ferryman who rowed the dead across r. Styx to Hades.
Charpentier, Gustave (b. 1860). Fr. composer; opera *Louise*, 5-517.
Charran, anc. city. *See* Harran.
Charter, a written deed or instrument granted by a sovereign or parl. conferring privileges on the recipient; boroughs, corporations, companies, institutions, etc., often receive charters; the most famous charter in Brit. history is Magna Carta.
Charterhouse. Originally a Carthusian monastery, in Clerkenwell, London; badly bombed 1940 and partially restored, 1951. After 1611 used as hospital for old men and a school for 40 boys. School developed into a great public school and moved to Godalming, Surrey, 1879. Merchant Taylors' School occupied London site, 1873-1939.
Charlism. Radical movement in Eng., culminating between 1840 and 1848; sought reform in parl. representation and universal adult male suffrage, 7-349 with illus.
Chartres (shahr'), Fr. Mfg. city; pop.

26,400; famous cathedral, 2-313 illus.
Chartreuse (shahrtréz'), La Grande. Original mother-house of Carthusian monks, near Grenoble, Fr.; Chartreuse, a famous liqueur, originally made at monastery.
Charybdis (karib'dis), in Gk. myth., whirlpool, Straits of Messina; Odysseus and, 5-501.
Chase. Metal frame containing the forme for a newspaper page or page(s) of book, 2-5; 5-404 illus.
Chassis, of motor vehicle, 5-277 illus.
Chateaubriand (shatôbr'ahn), François René, Vicomte de (1768-1848), Fr. author and politician; exquisite prose stylist, one of first romanticists (*René*; *Atala*; *Mémoires d'Outre-Tombe*); 3-455.
Château d'If. Tiny island off Marseilles, France, famous through Dumas' story *The Count of Monte Cristo*, 5-136.
Château Frontenac. Famous hotel in Quebec city, Canada, 6-321 illus.
Chatfield, Alfred Ernle Montacute, 1st Baron (b. 1873), Brit. admiral. First Sea Lord (1933-38). Awarded O.M. Jan. 1939.
Chatham, William Pitt, Earl of (1708-78). Brit. statesman, 2-309; and Amer. independence, 1-138; and Seven Years' War, 7-2.
Chatham. Spt. in Kent, on Medway, adjoining Rochester; pop. 46,940, 2-309, 4-398.
Chatham of San Cristobal Island. One of the Galapagos Is.; centre of govt., 3-498.
Chatham Islands, group belonging to New Zealand, 550 m. E.; 372 sq. m.; pop. 700.
Chauldon, Battle of (1453), in Hundred Years' War, 4-204.
Chatsworth. Mansion nr. Bakewell, Derbyshire, Eng.; seat of dukes of Devonshire, built 1687-1700; Mary Queen of Scots at, 3-77.
Chattanooga. Industrial city of Tennessee, U.S.A.; cotton, grain, coal, lumber and iron; pop. 130,333. Battle of Chattanooga (1863), Federal army defeated Confederates; 7-256.
Chatterton, Thomas (1752-70). Eng. poet and literary forger, 2-310.
Chatwood, Samuel (19th cent.). Brit. safemaker, 6-483.
Chaucer, Geoffrey (c. 1340-1400). Eng. poet, 2-311; influence on Eng. literature, 3-284; stories from *Canterbury Tales*, 2-312, 313.
Chauvinism (shôv'vinizm). Term for exaggerated patriotism or "Jingoism." Derives from Nicolas Chauvin de Rochefort, a veteran of Napoleon's army, who was devoted to Napoleon's memory.
Chaux-de-Fonds (shôd'fon), La. Tn. in Switz., n.w. of Berne in Jura valley; watch and clock-making; pop. 30,943.
Chavannes, Puvis de. *See* Puvis de Chavannes.
Cheapside. Historic London thoroughfare between St. Paul's Cathedral and Poultry, which is a continuation leading to the Mansion House.
Checkers. *See* Draughts.
Checkmate, in chess, 2-330.
Cheddar. Village in Somerset, Eng.; gives name to Cheddar cheese, 2-315; Cox's cave, 2-277 illus.; gorge, 7-8.
Cheek. Name given to part of a hide, 4-467 with diag.
Cheese, 2-313; protein in, 6-297.
Cheetah or hunting leopard. Animal native to Asia and Africa, 1-60 illus., 4-484 with illus.
Chefoo. Spt. of China on n. coast of Shantung; exports silk, groundnuts, soya beans; pop. 311,480.
Cheiron. *See* Chiron.
Cheka. *See* under M.V.D.
Chekov, Anton Pavlovich (1860-1904). Russ. story-writer and dramatist. His plays have little action but high emotional intensity esp. *Uncle Vanya* (1898), *The Three Sisters* (1901), *The Cherry Orchard* (1904); 3-122, 6-480 with illus.

CHER

Chekiang. Fertile maritime province of China on Pacific; 39,486 sq. m.; pop. 21,776,000; cap. Hangchow; produces silk, tea, cotton, fruit.
Chellean implements of the Stone Age, 5-107, 108 illus.
Chellean people. Primitive men living about 250,000 years ago, 5-104 illus. f.
Chelmsford, Frederick John Napier Theiss, 1st Viscount (1868-1933). Brit. politician. Viceroy of India (1916-21); First lord of Admiralty in Labour govt. (1924).
Chelmsford. Co. tn. of Essex; pop. 37,888; brewing industry, agricultural market; electrical and radio industries; 3-298.
Chelonina. Zool. order of tortoises and turtles, 6-388.
Chelsea. Met. bor. of s.w. London; pop. 50,912; contains Chelsea Hospital built by Wren for pensioned and disabled soldiers, in the gardens of which is held the annual flower show of the Royal Horticultural Society; porcelain mfr., 6 276 illus. f.; many writers and artists have lived here; 5-27.
Cheltenham. Spa in Glouce, Eng.; pop. 62,823, 2 315.
Cheltenham Ladies College. Girls' school; foundation, 2-315.
Chelyushkin, Cape, Siberia; northernmost point of Asian mainland, 1-261.
Chemical engineering, as a career, 2-231.
Chemical indicator. Dye which changes colour when dipped in an acid or a basic solution; use, 1-12.
Chemical industry, 2-324; alloys in plant, 1-115; detergents, 3-80.
Chemical pulp, in paper-making, 6-61.
Chemin des Dames ("Ladies' Road"). Fr. road running from point nr. Soissons along ridge between r. Aisne and Ailette to Reims; scene of bitter fighting in 1st World War.
Chemistry, 2-316; acids and bases, 1-11; development of atomic theory in, 1-296; catalysts, 2 322; coal tar derivatives, 2-433; colloids, 2 455; combustion, 1-80, 81, 2 322 3-328, 329; crystals and crystallisation, 3-4; detergents, 3 80; digestion, 3 89; dyes, 4-141; electrolysis, 3-220; elements, 3-22; 3-510; enzymes, 3-293; ether, 3-302; explosives, 3-328; food, 3-408; halogens, 4-120; infra red rays, 4-260; ions, 4-276; isomers, 2-321; isotopes, 4-301; metals, 5-177, 178; minerals, 5 213; molecules in gases, 3 508; nitrogen, fixation of, 6-217; oxidation, 6-22; organic, 2-319; Periodic Table of elements, 3-224; polymerisation, 6-219; photo-chemistry, 6-162; proteins, 6-297; radicle, 2-319; radio-activity, 6-351; spectroscopy and spectroscopy, 7-118, 7-127; careers in chemistry, 2-244, discoveries from magic, 5-79.
Chernitz. Tn. in Land of Saxony, r. Ger.; textile centre; pop. 250,188; machinery and leather mfrs., 4 1, 6-502. Named Karl-Marxstadt 1973.
Chemotherapy. Use of synthetic chemical drugs and antiseptics.
Chenab. R. of the Punjab, tributary of the Indus. Rises in n.w. Himalayas and flows s.w. to join the Sutlej; 600 m. long, 4-259, 6-41 6-310.
Chengtu. City in w. China on Min. r.; pop. 600,000; agricultural and mining centre.
Chénier (shân'yâ), André; de (1762-94). Fr. poet, one of the greatest of 18th cent.; guillotined during Reign of Terror for his opposition to the excesses of the Convention.
Chenille process. In carpet mfr., 2-219.
Cheops (Eg. king). *See* Khufu.
Chephren (Eg. king). *See* Khafra.
Chepstow. Tn. in Monmouthshire, or r. Wye; pop. 5,285, 5-246.
Cheque. In banking, 1-364, 6-236.
Chequered Skipper, butterfly, 2-111 illus.
Chequers. Historic mansion in Bucks, Eng., 2-327.
Cher (shâr). R. of central Fr., tributary of the Loire, 300 m. long.

CHERBOURG

Cherbourg [shér'bôôr]. Fr. Atlantic port and naval harbour on English Channel. Pop. 39,760; 3-438, 5-449; breakwater, 2-51.

Chermayeff, Sergius Ivan (b. 1900). Brit. architect, F.R.I.B.A.; collaborated in the design of the De La Warr pavilion, Bexhill, Sussex. Pres. and director, Institute of Design, Chicago, 1940-51, 1-218.

Chermes. An aphid, 1-183, 182 illus.

Cherokees. Indian tribe of S.E. U.S.A.; originally lived in mountain region of Virginia, the Carolinas, Georgia, Alabama, and Tennessee, before moving to Indian territory.

Cherrapunji. Hill station in Assam, India; wettest spot in the world, 1 268, 4-240, 6-360, 2-410 illus.

Cherry. Fruit-producing tree of the rose family, 2-327; fruit and blossom, 3-183 illus.

Cherry-laurel, poisonous plant, 4-455, 456 illus., 6-237 illus.

Cherry plum. See *Myrobalan*.

Chersonesus (kêr'son'sûs). Gk. word for peninsula, applied especially to Thracian Chersonesus (modern Gallipoli). Tauric Chersonesus (Crimea), and Cimbrian Chersonesus (Jutland).

Chervil. Biennial plant native to S.E. Europe. Height up to 2 ft. Used as flavouring for soups and sauces.

Cherwell, Frederick A. Lindemann, Viscount (b. 1886). Brit. physicist, prof. of experimental philosophy at Oxford from 1919; personal and scientific adviser to Sir Winston Churchill, 1940-41; paymaster-gen. 1942-43, and again from 1951-53.

Cherwell (chêr'well). R. in Northamptonshire and Oxfordshire, joining the Thames at Oxford; 30 m. long at Oxford 6-20.

Chesapeake Bay. Largest inlet on Atlantic coast of U.S.A.; scene of indecisive naval action between Eng. and Fr. during War of American Independence in 1781.

Chesham. Tn. of Bucks, Eng.; mfrs. chairs; noted for watercress beds and trout; pop. 11,428.

Cheshire. Co. in S.W. Eng. bordering on S. Wales and Irish Sea; area 1,019 sq. m.; pop. 1,258,050; co. tn. Chester, 2-328.

Cheshire cheese, 2-315.

Cheshire Cheese. Famous tavern off Fleet Street, London, associated with Dr. Johnson.

Chesil Beach. Ridge of pebbles over 16 m. long on coast of Dorset, 6-265, 2-167.

Chess. Game, 2-328; connexion with playing cards, 2-221.

Chester. Co. tn. of Cheshire, Eng. on r. Dee; pop. 48,229, 2-331, 3-248; mystery play cycle, 3-117.

Chesterfield, Philip Dormer Stanhope, 4th Earl of (1694-1733). Eng. statesman, author, and patron of literature; name used as a synonym for courtly manners; pub. letters to his son full of worldly wisdom.

Chesterfield. Tn. in Derbyshire; has Gothic church with curious crooked spire; ironworking, coal-mining; pop. 68,510.

Chesterton, Gilbert Keith (1874-1936). Brit. novelist, critic and satirist, 2-331.

Chestnut, scaly protuberance on leg of horse, 4-196 diag.

Chestnut. Deciduous tree, 2-332; nut, 5-187 illus. See also *Horse chestnut*.

Cetham's Hospital. School at Manchester; foundation, 5-112.

Chetwode, Philip Walhouse Chetwode, 1st Baron (1869-1950). Brit. soldier; served in Burma (1892-93); Boer War and 1st World War; o.-in-c. India (1930-35); F.-M. in 1933; Constable of Tower (1913-48).

Chevalier (sheval'yâ), **Albert** (1801-1923). Eng. character comedian, especially noted for rooster studies.

Chevalier, Maurice (b. 1889). Fr. actor and singer; famous on stage and films as comedian, dancer, and romantic "lord."

Cheverly, Elie (b. 1876). Fr. marine painter, 5-128, 129 illus. f.

Cheviot Hills. Range of hills on border between Eng. and Scot., highest point 2,676 ft., 6-511, 460, 3-9, 5-461.

Cheviot sheep, 7-22.

Chevron. In architecture, a zigzag moulding, characteristic of Norman architecture; a variety of fret ornament; in heraldry, a bent bar rafter-shaped, according to some a third, and according to others a fifth, of the field, 4-164 illus. f.; reverse of chevron, indicating rank of non-commissioned officers, 5-345; 6-162.

Chev'y Chase. Famous Eng. ballad celebrating battle of Otterburn (1388) in which Scots defeated English.

Chewing gum. Sweetmeat made from chicla, the sap of the Cent. Amer. sapodilla tree.

Chi (khi), **X**. Twenty-second letter of Greek alphabet; in Eng. words of Gk. origin, e.g. choral, the X is spelt "ch" and pronounced "k."

Chiang Kai-shek (b. 1888). Chinese soldier and administrator, 2-333, 2-375.

Chiang Kai-shek, Mme. (b. 1898). Chinese sociologist; daughter of the Soong family; educated in U.S.A.; married Chiang Kai-shek in 1927 and shared his work, strove for women's emancipation.

Chiangmai. Town of Siam, 7-15.

Chianti. Dist. of Tuscany, Cent. Italy. Gives name to a dry red or white wine made from grapes grown locally.

Chiapas (chê'pahs), Mexico. State in S. on Isthmus of Tehuantepec, on Pacific; 28,729 sq. m.; pop. 679,885; cap. Tuxtla Gutiérrez.

Chiari. It. city, 36 m. N. of Milan. Austrians under Prince Eugene defeated Fr. and Sp. troops in 1701.

Chicago, Illinois; 2nd largest city in U.S.A.; pop. 3,620,962, 2-333; as a port, 4-68; exhibition, 3-328.

Chicago University, foundation, 2-331.

Chichen-itza, Mexico. Ruined city in state of Yucatan, 21 m. W. of Valladolid; ruins include sacrificial pyramid, castle, and several temples. Attributed to the Itzas, forerunners of the Mayas.

Chichester. Cathedral city in Sussex. Eng., admin. centre for W. Sussex; pop. 19,110, 2-335, 7-196.

Chicken, embryo in egg, 3-239, 240 illus.

Chicken-pox. Highly contagious disease, chiefly of children, characterized by skin eruptions and fever; no relation to smallpox and seldom dangerous.

Chick pea. Flowering plant, grown as food in India, 6-99.

Chickweed. Common garden weed. *Stellaria media*, of fam. *Caryophyllaceae*, 7-158.

Chicle (chêkli or chik'h). Sap of the sapodilla tree of Cent. Amer., basis of chewing gum.

Chic'ory. Plant related to dandelion, largely cultivated for its root, which is ground and roasted for mixing with coffee.

Chidley, Cape. Northern limit of Labrador, 4-427.

Chief technician, in R.A.F., insignia, 6-462 illus.

Chiffchaff. Bird, migration, 5-204 illus. f., 7-119.

Chifley, Joseph Benedi (1885-1951). Australian politician; leader of Labour party, 1945; prime min. of Australia during 1945-1949.

Chigger. See *Jigger*.

Chigoe. See *Jigger*.

Chihuahua (chêwah'wah), Mexico. State in N. bordering on Texas, U.S.A.; 94,000 sq. m.; pop., 613,944; cap. Chihuahua.

Chihuahua, Mexico. City in silver-mining and stock-raising dist.; pop. 79,000; tin mines, 5-187.

Chilblains. An inflammation of the feet (sometimes of the hands or other parts of body) caused by exposure to extreme cold or by rapid changes in temperature; accompanied by painful swelling, burning, and itching.

CHINA

Child-care (Nursery Nursing), as a career, 2-231.

Childers, Robert Erskine (1870-1922). Irish author and politician; wrote German spy novel, *The Riddle of the Sands*; fought with Irish Republicans; executed by Irish Free State forces.

Children. Their upbringing and education, 2-338; training of Aztec children, 1-331; Barnardo's work for, 1-370; teaching deaf children, 3-56 illus.; imprisonment of, 6-291; changelings and fairies, 3-338.

Children's Books, 2-364; Beatrix Potter, 6-273.

Children's Charter. Drawn up by educationists of 19 nations (1942), 2-353.

Chile (chil'i). Republic on W. coast of S. Amer.; area, 286,100 sq. m.; pop. 5,760,000, 2-367, history, 2-359, 360; Bolivian war, 1-307; claim to Falkland Is., 1-170; copper production, 2-303; flag, 3-385 illus. f. See also *Earthquakes* (table).

Chili pine. See *Monkey-puzzle*.

Chillianwalla, Pakistan. Vil. in the Punjab; scene of battle in the second Sikh War in 1819.

Chillies. See *Red peppers*.

Chillingham. Village of Northumberland, Eng.; famous herd of pure white cattle in park of Chillingham Castle, 5-161.

Chiltern Hills. Range of hills in Bucks, Eng.; highest point Haddenham Hill (857 ft.), 2-195, 3-111.

Chiltern Hundreds. Three districts in Buckinghamshire, Eng., whose stewardship is a nominal office of profit under the Crown. As the acceptance of such disqualifies a member of Parliament (who by law may not resign his seat) the stewardship of Chiltern Hundreds has become an "appointment" enabling M.P.s to resign.

Chimæra (kimê'ra). In Gk. myth., fire-breathing monster with lion's head and serpent's tail; killed by Bellerophon.

Chimborazo (chimbôrah'zô). Volcano (extinct) mt. in Ecuador 100 m. S. of Quito; 20,700 ft.; one of the high est peaks in Andes, 1-119.

Chiming, of bells, 1-426.

Chimney, in rock climbing, 5-285.

Chimpanzee. African ape, 2-360, 1-56; compared with Man, 1-180, 181 illus.; 5-240 illus. f.; foot, 3-413 illus.; 7-526 illus.

China. Anc. state in Pers., 6-112.

China. Republic of eastern Asia; area 3,027,100 sq. m.; pop. 170,000,000, 2-361; map, 2-361; flag, 3-385 illus. f.; dragon emblem, 3-112; stamp, 7-113 illus.; character of people, 2-365; climate, 2-361; piracy, 6-206.

Life and Customs: fireworks, 3-364; kite-flying, 4-116; veneration of lotus, 5-40; marriage, 5-133; New Year customs, 5-110; pigtail, 2-373; religion and Confucianism, 2-366, 2-179, 1-270; superstitions, 5-79; primitive well-drilling, 1-255.

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Industry, Trade, Communications: agriculture, 2-368; coal, 2-428; Grand Canal, 2-205; dollar "Mex.", 5-187; silk mfr., 7-53; Shanghai trade, 7-15; tea, 7-232; transport, 2-368, 7-512 illus.; money, 5-235 illus.

History: anc. civilization in Asia, 1-269; early settlements, 2-361, 368; civil service in anc. China, 2-405; paper-making, 6-62; writing materials, 2-1; discovery of compass, 2-471; Formosa, 3-424; Opium War, 5-521; Gordon and Taping revolt, 4-48; wars with Japan, 1-272, 4-350; Chiang Kai-shek's régime, 2-333; and Tibet, 7-274; and 2nd World War, 7-491. See also *Earthquakes* (table).

CHINA ASTER

China aster, 1-277.
China clay, 2-375; in paper-making, 6-71.
China grass. See *Ramie grass*.
China sea, 6-26.
China's sorrow. Name given by Chinese to the Hwang-ho, or Yellow River, 4-212.
China-ware. See *Pottery*.
Chinchilla. Small fur-bearing rodent, 2-377, 3-496.
Chindita. Name (from mythological Burmese beast, half lion, half griffin) of special force led by Gen. Wingate in Burma 1942-44.
Chinese artichoke (*Stachys tuberosa*), 1-257.
Chinese carpets, 2-246, 252 illus. f.
Chinese jade. See *Jadeite*.
Chinese language, 4-145; dictionary, 3-88.
Chinese water deer, 3-60.
Ch'ing dynasty (1644-1911), rulers of China; art of, 2-303; vases, 2-372 illus.
Chingford. Borough of Essex, Eng., 10½ m. N. of London. Has large reservoir; pop. 48,330.
Chinghai. Second largest prov. of China. In N.W. Area 269,187 sq. m.; pop. 1,513,000; cap. Sining. Produces wool, hides, salt, gold.
Chinking (ch'ing-k'ang). China. Former treaty port on Yangtze r. 150 m. from mouth; pop. 199,776.
Chinook winds. Warm dry winds which descend from E. slopes of Rocky Mts. in N. U.S.A. and Canada, bringing great relief in cold weather. Stiller winds called foehn in Switzerland.
Chinquapin. Nut of dwarf type of chestnut; also water-lily seeds.
Chintz (Hindu "spotted"). Printed cotton fabric, usually with varicoloured patterns, and with highly enlaid surface.
Chios (k'ios). Fertile Isl. in Aegean Sea, w. of Smyrna, modern Selo: 320 sq. m.; pop. 75,853; reputed birthplace of Homer; ceded to Greece by Turkey in 1913; anc. Gk. colony. Cap. Chios or Castro.
Chipmunk. Ground squirrel native to N. Amer. and Siberia, 2-377.
Chippendale, Thomas (d. 1779). Eng. cabinet-maker; best work produced 1735-60; many others worked from the designs in his book *The Cabinet-Maker's Director* (1754), 3 191; chair, 3-493 illus.
Chippewa Indians. See *Ojibwa*.
Chipping Campden. Tn. in Glouc. Eng.; market hall, 4 35 illus.
Chipping Norton. Tn. in Oxfordshire, Eng.; pop. 3,879, 6 22.
Chirico (k'ir'iko). Giorgio di. It. painter; at Paris, with Chagall, he started first phase of surrealist painting; later returned to traditional academic styles.
Chiriqu Grande. Mt. of Costa Rica; 11,320 ft., 2-515.
Chiriqui, Mt.. Highest peak in Panama repub., 11,349 ft., 6 53.
Chiron (k'iron). In Gk. myth., a Centaur who educated many of the heroes; and Achilles, 1 10, 2 291.
Chiropodist (k'iro-pod'ist). Person skilled in the care of the feet.
Chiroptery, as a career, 2-231.
Chiroptera. Order of mammals, including bats and flying foxes, 5-103.
Chishima Islands. See *Kurile Islands*.
Chislehurst. Tn. in Kent, Eng.; pop. (with Slindon) 83,837; 4-398.
Chitambo. N. Rhodesia; Livingstone memorial, 6-394.
Chitin (k'i'tin). Horny substance making external skeleton of insects 4-264.
Chitral (ch'i'tral). N.W. Frontier Prov., Pakistan. Former native state, tn. on riv. N.W. Kashmir; area of state 4,000 sq. m.; pop. 80,000.
Chittagong. Spt. of E. Bengal, Pakistan, nr. s. terminus of Assam Bengal rly.; rice, jute, tea, hides exported; pop. 269,000, 6-39, 44.
Chivalry. Knightly class of feudal times, hence also qualities of the ideal knight—gallantry, a high sense of honour, and courtesy. See *Knight-hood*.

Chives. Variety of onion, 5-512.
Chkalov. Territory and town (formerly Orenburg) in Middle Volga area of U.S.S.R.; pop. of tn. 172,900.
Chladni, Ernst Florens Friedrich (1756-1827). Ger. physicist; writings include treatises on theory of sound and on acoustics. Remembered by the Chladni figures produced by the movement of sand on a vibrating metal plate, 7-86 with illus.
Chlamys (klam'is). Short cloak worn by ancient Greeks.
Chlorate. Salt of chloric acid. A powerful oxidising agent. Explosive when ground or detonated in contact with organic matter.
Chloride (klor'id). A compound of chlorine with an element; of lime, 1-484.
Chlorine (Cl). Chemical element, one of the halogens; atomic no. 17; atomic weight 35.5; highly poisonous gas, 2-377, 3-224; as disinfectant, 3-92; produced by electrolysis, 3-220 illus.; from hydrochloric acid, 4-215; no. of protons in atom, 4-301; commercial uses, 4-120.
Chloroform. A colourless volatile liquid with a pungent odour; an anaesthetic, 1-143, 7-195.
Chloromycetin. An antibiotic, treatment for typhoid fever, 1-175.
Chlorophyll. Green colouring matter in plants 1-447, 6-215, 1-154; absence in fungi, 3-489, 4 490; in algae, 1-104; fluorescence, 6 161; in leaves, 4 469; as a photocatalyst, 6-182; photochemistry, 6-162; from stinging nettles, 5-393.
Chloroplasts, in plant cells, 6-182, 4-469; in spiralgia, 1-101.
Chocolate. See *Cocoa and Chocolate*.
Choropsis liberianus. Species of pygmy hippopotamus, 4-180.
Choir (kwir). In architecture, part of church occupied by singers. Also term for singers themselves; types of choir, 7 58.
Choke. In an internal-combustion engine: the venturi or throat in the air passage of a carburettor (q.v.); also, a butterfly valve in a carburettor intake to reduce the air supply and so give a rich mixture for engine starting. In motor vehicles, 5 279. In radio, an inductance coil to prevent the passage of high-frequency currents; generally called an inductor (q.v.).
Choke damp. Miner's term for carbon dioxide or black damp; correctly any mixture of suffocating gases.
Choking, first aid for, 3-368.
Cholera. Infectious disease caused by a micro-organism in bad milk and water, and conveyed to human beings by flies.
Chopin, Frédéric François (1810-49). Polish pianist and composer, 2-378.
Chopine, 16th cent. women's shoe, 2-11 illus.
Chord. See *Aeronautics* (table).
Chord. See *Musical Terms* (table).
Chord, in trigonometry, 7-316.
Chordata (chordates). All animals with spinal cords, 7-395.
Chorley. Mannf. tn. of Lancs, Eng.; pop. 32,636; cotton, chemical, printing, and rubber industries.
Choroid. Lining behind retina in the eyeball, 3 331.
Chorus, in Gk. drama, 3-115, 118, dress, 1-227 illus.
Chosen. Jap. name for Korea, 4-425.
Chosroes I (koz'ro'ez). King of Persia A.D. 531-79; sacks Antioch (538), 1-176.
Chosroes II. Ruler of Persia A.D. 591-628; struggle with Byzantine Empire, 6-131.
Chou dynasty (1122-249 B.C.). Rulers of China, 1-269.
Chough (chuf). A small crow with red beak and feet, native of the western shores of Brit.
Chow-chow. Dog, 3-100 illus. f. See also *Dogs* (table).
Chrétien de Troyes (c. 1180). Fr. poet; and Arthurian legends, 1-256, 4-54.
Christ, the Messiah. Title of Jesus. See *Jesus Christ*.

CHRISTOPHE

Christadelphians (Gk. "brethren of Christ"). Christian sect founded in U.S.A. in 1848 by John Thomas, Brit. physician. Fundamental doctrines are the infallibility of the Bible and the natural mortality of Man, 2-464.
Christchurch. Tn. in Hampshire, s. coast, 30 m. w. of Portsmouth, at confluence of Avon and Stour rs.; great medieval church; pop. 20,506.
Christchurch. Tn. in S. Island, New Zealand; pop. (1954) 186,300; trade in timber, mutton, wool, 5-422.
Christ Church, Oxford; foundation, 6-18.
Christianing. See *Baptism*.
Christian, hero of Bunyan's *Pilgrim's Progress*, 2-126.
Christian II (1481-1550). King of Denmark, Norway and Sweden; conquered Sweden (1520); progressive but ruthless, he was ejected in 1523; attempted restoration in 1531; afterwards imprisoned.
Christian IV (1577-1648), king of Denmark and Norway; in Thirty Years' War, 7-270.
Christian V (1646-99), king of Denmark and Norway; weak but despotic ruler; waged unsuccessful war against Sweden.
Christian IX (1818-1906), king of Denmark; father of Queen Alexandra 1-100.
Christian X (1870-1917), king of Denmark; in 2nd World War, 3-75.
Christian, Fletcher. Master's mate on the *Bounty*; leader of the mutiny (1789), 2-27.
Christian Church. See *Church, Christian*.
Christiania. Name given to Oslo, Norway, when rebuilt by Christian IV after 1624. Old name restored in 1925, 5-466, 6 7.
Christianity, 2-379; the story of Jesus Christ, 4-363; in Africa, 1-50; apostles at Antioch, 1 176; baptism, 1-366; in the Balkans, 1 350; confirmation, 2-479; sign of the cross, 2-635; in Japan, 4-349; the Madonna in art, 5-66; and New Testament, 1-441; St. Patrick, 6-96; St. Paul, 6-97; St. Peter, 6-145; persecution of Christians, 5-198, 5-368; foundation during "Roman peace," 6-434; in Russia, 6-473.
Christian name, and baptism, 1-366.
Christian Scientists. Sect, 3 464.
Christian Socialists, group formed about 1848 with a view to giving a Christian direction to the expanding socialist movement. Kingsley and, 4-109.
Christie's. Firm of London auctioneers, (Christie, Manson, and Woods) famous for dealings in pictures and *objets d'art*. Founded 1766 by James Christie, the elder (1730-1803).
Christina (1626-89). Queen of Sweden, brilliant, erratic daughter of Gustavus Adolphus; succeeded in 1632; abdicated 1654 in favour of her cousin, Charles X.
Christmas, 2-381; boar's head, 6-197; holly custom, 4-187; mistletoe, 5-228; origin of Christmas tree, 2-382.
Christmas cactus, 2-161 illus. f.
Christmas carols, 2-382.
Christmas Island. Part of Singapore Colony, 220 m. s. of Java; area 60 sq. m.; pop. 1,500; 7-57.
Christmas rose, plant of genus *Helleborus*, of buttercup family. Flowers in winter, vary in colour from white to pink. Wild, greenish-flowered species are settarwort and stinking hellebore, both of which are uncommon.
Christmas tree, German origin, 2-382.
Christ of the Andes. Statue marking Chile-Argentina boundary, 1-149 with illus.
Christophe, Henri (1767-1820). King of Haiti; freed Negro slave, became lieutenant of Toussaint and Dessalines and life president; proclaimed king in 1811; killed himself during rebellion provoked by his cruelties.

CHRISTOPHER

Christopher, St. (3rd cent.). Christian martyr and patron of travellers; said to have been a giant who carried people across a stream; called *Christophorus* "Christ Bearer," by the Christ Child, whom he unwittingly carried across. Festival July 25 in R.C. Church, March 9 in the Gk.

Christopher III (d. 1148), king of Denmark, Norway and Sweden.

Christopher Robin. Little boy who appears in some of A. A. Milne's books for children, 5 209.

Christ's College, Cambridge University, 2-182.

Christ's Hospital School, formerly in London, now at Horsham; school band, 6 505 illus.

Chromatic. See *Musical Terms* (table).

Chromatin, in nucleus of cell, 1-448, 119 illus.

Chromatography. Method of separating and analysing a liquid chemical compound into its individual substances by capillary (q.v.) attraction, so that each substance is indicated by its particular colour on a cylinder of absorbent chalk or paper, 7-192.

Chrome steel, alloy of chromium and steel; industrial uses, 2 383.

Chromite. Ore in which chromium is found, 2-382, 383.

Chromium (Cr). A silvery blue metallic element of the transition group; atomic no. 24; atomic weight, 52.01; 2 382, 3-224; in stainless steel, 4 296; salts used in tanning, 4-468.

Chromo-lithography. Colour printing process, 6-293.

Chromosomes. Rod-shaped threads in the nucleus of a gamete; in heredity, 4 166; in plants, 2-25; in living cells, 2 286, 1 149 illus.

Chromosphere, of sun, 7 190.

Chronicles. Two Books of the Old Testament (originally one), supplementing history given in Books of Samuel and Kings.

Chronometer. A type of clock, 2-383; and navigation, 5 339.

Chrysalis. The pupa stage of metamorphosis in butterflies and moths, 4 268; of swallow-tail butterfly, 2 137 illus.

Chrysanthemum. Flowering plant, 2 384.

Chryseis [kris'is]. In Homer's *Iliad*, captive daughter of a Trojan priest of Apollo; Agamemnon refused ransom offered by her father until Apollo sent pestilence to (Gk. camp) *Chryseida madagascariensis*. Moth 2-112 illus.

Chrysler building, New York, 5 112 111 illus.

Chrysoberyl [kris'ober'il]. A mineral, beryllium aluminate, used as semi-precious stone. See *Stones, Precious* (table).

Chrysolite. A variety of chrysoberyl. See *Stones, Precious* (table).

Chrysoprase. A coloured variety of quartz, 6-320. See *Stones, Precious* (table).

Chrysostom [kris'ostom]. John, St. (c. 357-407). "The golden-mouthed," a monk of Antioch, most famous of Gk. Fathers, called the greatest orator of anc. Church.

Chub. A coarse fresh-water fish, 6-404.

Chubb, Charles (d. 1845). Brit. safe-maker, founded Chubb and Sons; designed locks and fire and burglar-proof safes, 4-534, 6-483.

Chu-kiang, r. of China; Hong Kong at mouth, 4-191. See also *Canton River*.

Chukka. Period of play in the game of polo, 6-255.

Chulalongkorn (1853-1910), king of Siam; succeeded to throne in 1868; introduced many reforms.

Chungking, China. Port in Szechwan on Yangtze; pop. 1,900,000; exports skins, timber, silk and tea.

Church, Christian, 2-379; architecture, 1-210; use of bells, 1-425; Christmas festival, 2-381; church music, 5-303; use of fan in ceremonies, 3-340; in feudal system, 3-348; hymns, 4-236; inquisition, 4-263; early Christian paintings,

6-33; iconoclasm, 2-150; martyrs, 5-138; religious drama, 3-117; careers in the Church, 2-231. See also *Christianity*; *Church of England*; *Church of Scotland*; *Free Churches*; *Papacy*; *Reformation*; *Roman Catholic Church*.

Church Army. Evangelist body of Church of Eng., founded in 1882 by the Rev. Wilson Carrile; its social work includes care of waifs and strays, help for the aged, needy and disabled, housing schemes, youth work, etc.

Church Assembly. In Church of Eng., 2 386.

Church festivals. Christmas, 2 381 Easter, 3-154; harvest, 4-134.

Churchill, Lord Randolph (1849-95). Brit. statesman, third son of 7th Duke of Marlborough; brilliant but erratic Conservative free-lance; sec. for India (1885-86) and twice leader of the House of Commons.

Churchill, Sir Winston Leonard Spencer (b. 1874). Brit. statesman and author, 2-385; on Battle of Britain, 2-79; and Roosevelt, 6-450; and Atlantic Charter, 7 334; and 2nd World War, 7 332 333, 187 488; in mosaic, 5 269 illus.

Churchill, formerly Fort Prince of Wales, Manitoba, trading station and port on Hudson Bay, 4-200.

Churchill River, in cent. Canada; rises in w. Saskatchewan; flows E. and S.E. about 1,100 mi. to Hudson Bay, 4-200.

Church Missionary Society (C.M.S.). Missionary body founded 1799, for work in the East and Africa; it has several thousand missionaries and schools, training college, and other institutions.

Church of England, 2 386; Henry VIII and break with Rome, 4 164, 3 277; confirmation, 2 179.

Church of Scotland, 2 387, 4 114.

Church of the Nativity, Bethlehem, Jordan, 1-439.

Church of the Holy Sepulchre, Jerusalem, 4-302.

Churchwardens, in Church of England 2 387.

Churriguera, José (d. 1725). Span. architect, exponent of exaggerated form of the Baroque style, 7-112.

Chuvashia. Autonomous republic of R.S.F.S.R.; area 7,192 sq. m.; pop. 894,475.

Chwarel y Fan. Mt. in Monmouthshire Eng., 2,228 ft. 5-246.

Chyle. [kil] Food-stream in digestive process, 3-90.

Chyme [kilm]. Food partly digested by stomach, 3 90.

Ciano [chah'no], Count Galeazzo (1903-41). It. statesman; married Mussolini's daughter, Edda, in 1934; minister for Foreign Affairs, 1936-43; disagreed with Mussolini's policy and was executed by "fascist republicans" Jan. 1944; diary pub. 1947.

Cibber [sib'er], Colley (1671-1757). Eng. actor and dramatist; hero of Pope's *Dunciad*; wrote *Apology*, amusing autobiography; poet laureate, 6-23.

Cibola. Fabled cities of America, 1-134.

Cicada. Large four-winged insect, order Hemiptera, 2-36.

Cicero, Marcus Tullius (106-43 B.C.). Roman statesman, writer and orator, 2-387; influence on Latin prose, 4-450; Demosthenes his model, 3-71; and Athens, 1-288.

Cid, The (Arabic, *E' Sidi*, the lord). Popular name of Rodrigo, or Ruy, Diaz do Bivar (c. 1010-99); called also *El Campeador*, the Champion, Sp. national hero, 7-105; and bull-fighting, 2-121; epic poem, 7 121.

Cider and Perry. Fermented drinks made from apples and pears respectively, 2-388.

Cienfuegos [sionfw'gōs]. Cuba. Port on s. coast; centre for sugar and tobacco trade; 3-6.

Cierva, Juan de la (1895-1936). Span. engineer; inventor of the "Autogiro," 4-158, 1-326.

CINTRA

Cigarette cards, collecting, 2-453, 452 illus.

Cig'oli, Lodovico Cardi da (1559-1613). It. painter, famed for his beautiful colouring.

Cilia'ta. Class of protozoan animals with vibratory hairs, or cilia.

Cilicia [shish'ia]. Anc. country of S.E. Asia Minor on Mediterranean coast; now part of Turkey; noted for forests, grain and wine. Rom. prov. 64 B.C.

Cilician Gates (Gulek Bo'ghaz). Famous pass through Taurus Mts. from Cappadocia to Cilicia.

Cimabue [shémah'boō]. (1240-1302). Florentine painter, whose real name was Giovanni Gualtieri; credited with revival of painting in It. after Dark Ages; teacher of Giotto 4-21-317.

Cima da Conegliano (1449-1517). It. painter; also known as Conegliano from tendency to fill in his pictures with landscapes of his native country, 4-318.

Cimarosa [shémah'rō zah], Domenico (1749-1801). It. musical composer; worked at Courts of Empress Catherine II of Russia and the Emperor Leopold II. *Il Matrimonio Segreto* is his masterpiece.

Cimbri [sim'bri]. A Germanic tribe; invasions into Rom. empire, 4-5.

Cimmerians. In Gk. (Homer) myth, far western or northern people who lived in perpetual ("Cimmerian") darkness; also certain anc. historical inhabitants of the Crimea.

Cimon (c. 504-449 B.C.). Athenian statesman and war leader; son of Miltiades; fought at Salamis, drove Persians out of Thrace, Caria, Lydia, banished 461 B.C. through influence of Pericles, but recalled and restored to naval command.

Cinchona [shinkō'na]. Evergreen tree from whose bark quinine is obtained, 5 93; and treatment of malaria, 6 325.

Cincinnati. Tn. in Ohio, U.S.A.; pop. 500,510, 5-506. origin of name, 2-388.

Cincinatus, Lucius Quintus (c. 519-139 B.C.). Dictator of Rome, 2-388.

Cinco de Mayo. Mexican national holiday in honour of Fr. defeat in 1862, 5-189.

Cinderella. Household drudge in a fairy tale. A fairy enables her to go to a prince's ball; the prince falls in love with her; she is reunited with the prince through a glass slipper, which she dropped as she left the ball, and which will fit no foot but her own.

Cinema. Films and how they are made, 2-389; early comedies and Chaplin, 2 304; effect of the talkies 2 401; Hollywood industry 2 177, 5 38; cinema organ, 6 3; model sets, 5-230. See also *Cinema Terms* (table) in next page.

Cinera'ria. Familiar garden plant which came originally from the Canary Isls.

Cingalese. See *Sinhalese*.

Cinna, Lucius Cornelius (d. 84 B.C.). Rom. noble; consul 87-84 B.C.; one of principal supporters of Marius against Sulla; his daughter Cornelia married Julius Caesar.

Cinnabar. Mercuric sulphide; mercury from, 5-174.

Cinnabar Moth, 2-144 illus.

Cinnamon. Evergreen tree; powdered bark used as a spice, 2-192, 7-131 illus.

Cinnamon stone. Gem stone allied to the garnet; orange-red in colour; obtained chiefly in Ceylon.

Cinquecento. It. name for 16th cent.

Cinquefoil. Common weed, with leaves divided into five leaflets (*Potentilla reptans*), having bright yellow flowers.

Cinque Ports [sɪnk]. Originally 5 Eng. south-coast ports, but 35 others have been added at different times, 2-402; arms, 4-165 illus. f.

Cinto, Monte. Highest mt. in Corsica; 8,889 ft., 2-512.

Cintra. Tn. 17 m. N.W. of Lisbon Portugal; royal palace, 6-209 illus.

A LIST OF COMMON CINEMA TERMS

Action 1. Director's signal for "begin the scene."

Adaptation. Alteration of book play or story so as to form basis of a film.

Animation. Process of making moving cartoons, apparent motion of inanimate objects, and the like.

Arc. Powerful carbon arc lamp.

Back Projection. Showing actors in front of scene separately filmed.

"Blimp." Sound proof box in which the camera head is placed so that the working of the mechanism shall not be picked up by the sound microphone.

Breakaway. A bottle, club or other object, made of wax or some light material, which breaks when the victim is struck. Breakaway furniture is commonly made of veneer wood.

Casting Director. One who selects and arranges cast of a film.

Chemical fade. Chemical treatment of negative to give a fade in or fade out effect.

Close-up. Close view of an artist or object on screen.

Continuity. Succession of scenes thus running through picture.

Continuity Girl. Script girl who "prompts" the cast in the scene to be acted and generally assists the director.

Credit titles. Names shown on screen at beginning of film.

Crowd artist. An extra or super, one who works in crowd scenes.

Cut 1. Director's command to stop the scene, the camera and sound motors are "cut," and the scene stops.

Cutter. A film editor.

Diffusion disc. A disc placed over camera lens to tone down hard lines of the photography.

Director. Person chiefly responsible for the creative work of making a film—i.e., for the acting, setting, etc.

Dissolve. The melting of one scene or image into another such as a young actor dissolving into an older person.

Dolly. A small cart on which camera can follow or move about the set.

Double. Actor who takes the place of a star in a hazardous bit of action.

Double exposure. The photographing of two separate images on one film.

Dubbing. The sound effect is sometimes "dubbed" in or added after the completion of the photographing of a scene.

Dupe negative. A negative film secured by printing from a positive. News reels are printed from several "dupes" in order to gain speed in distribution.

Exteriors. Scenes which are taken out of doors, or out of scenes staged in the studio.

Extra. A crowd player or super.

Fade. A gradual darkening or lightening of the whole scene. Accomplished in professional cameras by the shutter, which closes or opens slightly over each successive exposure, thus gradually and progressively decreasing or increasing the exposure.

Fade in. To start with a black screen and build up the picture to full brilliance.

Fade out. To reverse the preceding effect.

Feature player. Artist either supporting a star or sharing the honours with other artists. (See Star).

Film editor. A person who edits or cuts the film.

Flicker. The intermittent fluttering of light and dark on the screen. May be due to slow speed of the projecting machine, or faulty adjustment.

Floor (The). Studio where picture is being filmed.

Follow focus. To adjust the focus of the camera lens as the subject moves nearer to or further away from the camera, during the filming of a scene.

Frame. One picture of a moving picture film.

Gate. The part of the film track where the film is exposed or the corresponding place in the projector where the picture is projected to the screen.

Gripps. Labourers who move heavy objects in the studio.

Halation. Glare of light on a film on white clothes and metals.

Hard lighting. Use of undiffused light to create a certain mood in the lighting of a set. An example is the growling of a burler, where the effect is wanted of weird lighting and shadows.

Iris in. Gradual fading or illumination of a scene on the screen through a widening or decreasing circle.

Location. Filming in actual or out of door setting of incident.

Mac goo pie. A custard pie used in slapstick comedies.

Master negative. The final arrangement of the negative. From this will be printed the positive prints for distribution throughout the country.

Mixer. Man who controls the volume of voice and sound sound recorder.

Mixing panel. The electrical equipment for effecting the proper relation between sounds in making the sound track.

Monitor. An operator who listens to all sounds being recorded to ensure correct balance and effect desired.

Montage. A word used to denote quick cutting (mixing) in a movie effect.

Multiple exposure. More than three exposures on one frame or series of frames.

"Non-flam." Safety or non inflammable film. This type of film is always used for home pictures.

OK for sound. The scene all right for recording in sound films.

Pan. To swing the camera slowly about to follow a moving scene.

Playback. Used mostly during the making of musical pictures. Music and singing are carefully recorded beforehand then played back in the studio through loud-speakers, while the artists are photographed acting and singing in time with their own recording.

Pre-view. A picture tiled out at a theatre to see how the audience likes it.

Producer. Person who supervises the making of a film as an article of commerce. He controls costs, etc.

Projection box. The small room in a cinema where machines are situated that project the film on to the screen.

Projection theatre. A small theatre where a picture is shown at the studios.

Prop. Object used in the action of a story or play. Not to be confused with the furnishings of a set, which are not handled by the actors.

Quickies. A cheap and hurriedly made production.

Reel. A length of film (usually 1,000 feet) wound on a spool.

Release. The finished picture, available for rental on and after a certain date the release date.

Reverse motion. Comedy effects secured by running the camera backwards, or turning it upside down.

Running shot. A scene secured with the camera on a platform on the front of a car, etc. Used to show action taking place while the subject moves along, as in driving a car.

Rush. A positive print made overnight from negative shot in the studio during the day. Viewed by the director and producer the following day.

Scenario. The actual film story complete and written in sequence suitable for filming.

Script. The director's working scenario. Contains all directions and changes made in the original scenario.

Sequence. A series of scenes in a movie or less logical order.

Set. A representation of a room or any other place in which action takes place. May be indoors or otherwise.

Slapstick. Very broad comedy.

Slow motion. The apparent speed of the action is slowed down by light graphing it at several times the normal camera speed, and then projecting it at the standard 24 frames per second.

Spool. A reel on which film is wound.

Star. Player whose name is given greater prominence than the title of the film, and is considered a greater office draw than either the story or the direction.

Still. A picture taken with an ordinary camera usually for advertising purposes.

Stop motion. The method by which animated effects are secured. A reel of film is exposed for each turn of the crank. Between each exposure the object being animated is moved slightly.

Super. A giant production. Also in artist playing a crowd part.

Synchronism. The proper running of cameras and sound recording machine so that the sound shall occur at the right moment when the picture is projected.

Take. As each scene is photographed perhaps again and again until what is wanted is correct, it is given a number. Each of these attempts is called a "take."

Test. A brief film made of artists to test their suitability for a part.

Three-Dimensional Film. Scenes photographed on two films corresponding to the vision of each of the human eyes are projected simultaneously and viewed through polarised spectacles which permit each eye to see only the image meant for it. A stereoscopic effect is produced. Characters and objects appearing to stand out solidly from the background.

Trade show. Special performance of film for cinema owners, and critics before public showing.

Trailer. Short extract from a film exhibited in cinemas as an advertisement.

Wide Screen. Systems of photography and/or projection which give a panoramic effect and some illusion of depth by using a curved screen of much greater width than that customarily used. (Cinerama uses 3 films shown simultaneously through 3 projectors, each covering one third of a wide screen. In the "Cinemascope" scenes taken with a wide angle lens are projected from a single projector, equipped with special correcting lens, on to a curved screen 24 times as wide as it is high.)

CINTRA MTS.

Cintra Mts. Portugal, near Lisbon. 4-521.

Ciphers. See Codes and Ciphers.

Circassia [serkash'ya]. Region of n.w. Caucasus; originally independent but added to Russia by treaty of Adrianople (1829).

Circe [sɜːsɪ]. In Gk. myth., a sorceress who could turn men into beasts. 2-402.

Circle, area of, 5-170.

Circuit. In electricity, a number of conductors connected together for the purpose of carrying a current. When they form a closed path through which a current can circulate, as in a cell with its terminals connected, the circuit is said to be closed; when the path is not closed, as in a multi-lighting system, the circuit is open: 3-211-214.

Circuit-breaker. A switching device for interrupting and restoring the passage of an electric current through a circuit. Its simplest form is the electric light switch. A protective circuit-breaker automatically interrupts the flow of current in the event of overloading or other dangerous conditions; an everyday example is the fuse in a lighting circuit. 3-213.

Circus (Latin for "ring"). From Roman times to present day. 2-403.

Circus Maximus. High oval building in Rome used for chariot races and gladiatorial fights. 2-403.

Cirencester. Market tn. of Gloucestershire; the Rom. Corinium; pop. 11,118. 4-31.

Cirl bunting. Bird found in s. counties of Eng. 2-125.

Cirque de Gavarnie. Pyrenees, Fr. A large gully carved out of rock by glacial erosion. 6-313, 314 illus.

Cirrhosis. Diseased condition of the liver; cause, 4-524.

Cirrocumulus, clouds. 2-421, 122 illus.

Cirrostratus, clouds. 2-421.

Cirrus, clouds. 2-421, 422 illus.

Cisalpine Gaul. Portion of N. It. bounded on N. by Alps, on S. by Rubicon; conquered by Rome.

Cisalpine Republic. State in Italy set up by Napoleon in 1797. Milan was the cap. In 1805 it was merged into the kingdom of Italy.

Cissa. King of the South Saxons (511-536). Founded city of Winchester; name of latter derived from Cissa (Caster (town of Cissa), 2-335).

Cistercians. Order of monks founded in 1098. 5-214, 215 illus.

Cithæron. Mt. range in Greece, now called Elata; famous in Gk. myth., especially in connexion with Dionysus.

Citrate. A salt of citric acid.

Citric acid. Complex organic acid obtained from citrus fruits. 4-11.

Citroen, André Gustav (1878-1935). Fr. motor-car mfr.; known as the "French Ford."

Citron. Large lemon-like fruit of semi-tropical tree, *Citrus medica*; provides candied peel.

Citronella, oil. 5-506.

Citrus. Genus of evergreen trees native to Asia. Includes orange, lemon, lime, citron, grapefruit.

City. In the U.K., a cathedral town, or some large town given city status by royal charter.

WORLD'S LARGEST CITIES

	Pop.	Year
1. London ..	8,346,137 ..	1951
2. New York ..	7,891,957 ..	1950
3. Tokyo ..	6,966,499 ..	1955
4. Moscow ..	4,137,000 ..	1939
5. Calcutta ..	4,000,000 ..	1951
6. Chicago ..	3,020,962 ..	1950
7. Berlin ..	3,357,000 ..	1951
8. Leningrad ..	3,191,000 ..	1939
9. Buenos Aires ..	3,000,000 ..	1947
10. Paris ..	2,830,000 ..	1947

N.B.—The first four include what are known as the "Greater" areas; the year given is that of the last census or reliable estimate.

City of London. See London.

City of London School. Estab. 1834; the original foundation was a bequest by John Carpenter in 1442. 5-28.

City-state, in Greece, 4-73; in Italy, 4-313.

Ciudad Bolívar [səˈbɒˈdád bɒlɪˈvahr], Venezuela. City on Orinoco r.; pop. 25,000; 6-3.

Ciudad Rodrigo. Fortified frontier tn. in w. Sp.; pop. 12,100; taken by Fr. under Ney in 1810; retaken (1812) by Brit. under Wellington.

Ciudad Trujillo [troohyōˈjɪl]. Formerly Santo Domingo, cap. of Dominican Rep., W. Indies; pop. 125,000; 3-106.

Civet. Fatty substance obtained from glands of the civet cat; used in perfume. 6-124 illus.

Civil Aviation. See Air Transport.

Civil Defence; war-time fire services. 3-361.

Civil engineering, as a career. 2-231.

Civil List. Sum of money voted by Parliament on the accession of a new sovereign for the regular and domestic expenses of the Crown.

Civil Service. In the U.K. general name given to those depts. concerned in the admin. of the civil affairs of the state. 2-405, 4-51, 52; careers in, 2-234, 230.

Civil War in England (1612-18); origins of and Charles I., 2-306, 3-278; Cromwell, 2-533; army development, 1-218; battles in Oxfordshire, 6-19; siege of Chester, 2-331; Bristol, 2-73; siege of Colchester, 2-118; siege of Carlisle, 2-212.

Clackmannan. Co. tn. of Clackmannanshire, Scot.; pop. 3,022, 2-105.

Clackmannanshire. Co. of Scot.; pop. 37,528; area 55 sq. m.; co. tn. Clackmannan. 2-405.

Clacton. Seaside resort of Essex, Eng.; pop. 24,085, 3-298.

Clawen Dam. Radnorshire, Wales (210 ft. high). 3-29, 31 illus.

Clair, René (b. 1898). Fr. film producer and writer. Best known film *Sous les toits de Paris*; 2-401.

Clairvoyance (Fr. "clear seeing"). The psychic power to observe things not actually visible to the eye.

Clam. Largest of the molluscs, 2-437, 7-24.

Clameur de Haro. 2-302.

Clan. A family or union of related families bearing the same surname. 2-406.

Clapham. Dist. in s.w. London, forming part of the bor. of Wandsworth. It has a large common of 220 acres. 5-28; Clapham rly. junction one of the largest in world.

Clapp's Favourite. Variety of pear, 6-100.

Clare, St. (1194-1253). It. nun; follower of St. Francis; and Poor Clares, 3-157.

Clare. Maritime co. in n.w. of prov. of Munster, Irish Rep.; area 1,230 sq. m.; pop. 81,350. Agriculture is poor; cattle and sheep are reared. Co. tn. is Ennis.

Clare College. Cambridge University, 2-181.

Clarence, Albert Victor, Duke of (1861-92). Eldest son of Edward VII; betrothed to Princess May of Teck (Queen Mary), 5-140.

Clarenceux, King of Arms. 4-185.

Clarendon, Edward Hyde, 1st Earl of (1609-74). Eng. statesman and historian. Charles II and 2-308.

Clarendon, George Herbert Hyde Villiers, 6th Earl of (b. 1877). Undersecretary for Dominions (1925-26); chairman B.B.C. (1927-30); gov. gen. of Union of S. Africa (1931-37); Lord Chamberlain (1938-52).

Claret. A light Bordeaux wine, 2-17, 3-437.

Clarinet. Musical instrument of the woodwind group. 5-307, 7-473.

Clarion. Musical instrument, 7-322.

Clark, Mark Wayne (b. 1896). Amer. soldier; c.-in-c. U.S. 5th Army and later Allied 15th group in Italy, 1943-45; U.N. c.-in-c. in Korea,

CLENCH

1932-53; retired from U.S. Army 1953; 4-436.

Clarke, Charles Cowden (1787-1877). Eng. author and friend of John Keats, 4-304.

Clarke, Marcus (1840-81). Australian novelist, 1-321.

Clarkson, Thomas (1760-1846). Eng. philanthropist; active worker in the cause of anti-slavery.

Clary sage oil. a vegetable fixative for perfumes, 6-121.

Clasp nails. 5-313.

Class, in biological classification, 1-452.

Classics, The. Term used for writers of anc. Gk. and Rom. periods, 4-92.

Classics, The. In horse racing the five principal English races for three-year-olds—the 2,000 Guineas and 1,000 Guineas at Newmarket; the Derby and the Oaks at Epsom; and the St. Leger at Doncaster. 4-198.

Classic style, in architecture, 1-212, 217.

Classification, of plants, 4-515.

Claude Lorrain (1600-82). Fr. landscape painter, 3-139, 6-34; Disembarkation of Cleopatra, 3-142 illus.

Claudius I (10 A.C.-A.D. 54). Rom. emperor, nephew of Tiberius, 6-437; conquest of Britain, 3-275, 2-73; poisoned by Agrippina, 5-367.

Claudius II (d. 270). Rom. emperor; conquest of Goths, 4-19.

Claudius, Appian. Rom. decemvir 451-419 B.C., whose attempt to abduct Virginia, daughter of a centurion, caused revolution and abolition of the decemvirate; story told in Macaulay's *Lays of Ancient Rome*.

Claudius, Appian. Rom. patrician chosen to censorship 312 B.C.; builder of Appian Way and Claudian aqueduct. 3-180.

Clause, in a sentence, 6-531.

Claude, Sir George (1852-1914). British artist of figure and landscape; R.A. in 1908; 3-263.

Claverhouse, John Graham of, Viscount Dundee. See Dundee, Viscount.

Clavichord. Musical instrument, ancestor of piano. 5-309, 6-194 illus.

Clavicle. See Collar-bone.

Clay, 2-406; for brick-making, 2-57, 58; as a soil, 2-155; in "leud" pencils, 6-113; soil, 7-83.

Claymore. Two-edged broadsword of the Scottish Highlanders; originally two-handed.

Clayton, John (1657-1727). Eng. clergyman; and gas lighting, 3-505.

Clayton, Philip Thomas Byard (b. 1885). Brit. chaplain; founder of Toc H.

Clear, Cape. The southernmost point of Ireland in s.w. of Clear Isl., co. Cork.

Cleat. See Nautical Terms (table).

Cleddau. Two rs. of Pembrokeshire, Wales. The East Cleddau (15 m. long) and West Cleddau (20 m. long); both flow into Milford Haven.

Clee Hills. Range in Shropshire, 14 m. long; highest point, Brown Clee Hill, 1,792 ft.; stone is quarried.

Cleethorpes. Seaside resort of Lincs, Eng.; pop. 29,558, 4-512.

Clefs, in music, 6-305.

Clematis. Climbing plant, 2-406; sepals, 3-400.

Clementeau, Georges Eugène Benjamin (1841-1921). Fr. statesman; premier 1906-09, 1917-20. 4-531.

Clement, Samuel Langhorne (1835-1910). See Twain, Mark.

Clement, popes. For list see Pope.

Clement IV (d. 1268), elected Pope 1265; befriends Roger Bacon, 1-341.

Clement V (1264-1314). First Avignon Pope, elected 1305, abolished order of the Templars; flight to Avignon, 1-329; Philip II and 6-165.

Clement VII (Ghilio de' Medici) (c. 1480-1534). Pope besieged in Castle of St. Angelo during Sack of Rome by Constable de Bourbon in 1527; as prisoner of Charles V, 4-314; refused to divorce Henry VIII and Catherine of Aragon.

Clement VII (d. 1394), first anti-pope of the Great Schism; elected 1378.

Clement XIV (1705-74). Elected Pope 1769; suppressed the Jesuits.

Clench (boat-building). See Clinker-built in Nautical Terms (table).

CLEON

Cleon (d. 422 B.C.). Athenian politician, opponent of Pericles, and leader of the democracy.

Cleopatra (69-30 B.C.). Queen of Egypt, 2-407; and Antony, 1-309.

Cleopatra's Needle, London, 2 408, 5-21.

Clepsydra. See *Water clock*.

Clerestory. See *Architectural Terms*.

Clergy. Term used for all ordained priests in Christian Church; in Middle Ages, 2-380; benefit of clergy, 1-102.

Clerihew. Form of comic verse in two irregular couplets invented by Edmund Clerihew Bentley in *Biography for Beginners* (1905).

Clerk, Sir Dugald (1854-1932). Brit. engineer, pres. of the socy. of Brit. gas industries, 1906-08; knighted 1917; invented a 2-stroke gas engine (the Clerk cycle).

Clerk Maxwell, James. See *Maxwell, J. C.*

Clerk of works, training for career as, 2-234.

Clermont-Ferrand, Fr. City w. of Lyons; pop. 109,000; 13th cent. cathedral; 2-434.

Clevises. Variety of the mineral uranite or pitchblende. Consists mainly of an oxide of uranium and rare earths. Black in colour and often contains traces of helium, which can be separated, by heating; helium detected in, 4-160.

Cleveland, Stephen Grover (1837-1908). 22nd president of U.S.A.; in 1885-89, re-elected for 1893-97.

Cleveland. Moorland dist. of Yorks; important for iron deposits, the industry centring in Middlesbrough.

Cleveland, Ohio, U.S.A., on L. Erie, at mouth of r. Cuyahoga; pop. 905,636; iron and steel; clothing, motor-car mfrs.; 5-506.

Cleves. Tn. in North-Rhine Westphalia, W. Ger.; formerly cap. of duchy of Cleves; pop. 20,000; castle associated with the legend "Knights of the Swan," immortalised in Wagner's *Lohengrin*.

Clew. See *Nautical Terms* (table).

Clik beetles (family *Elateridae*), habits, 1-411, 7 500.

Clifden. Connemara, Irish Rep., 4-243 illus.

Clifden butterfly, or *Adonis Blue* 2-135 illus.

Cliff Dwellers. Prehistoric race of S.W. U.S.A.; ancestors of Pueblo Indians.

Clifford, John (1836-1923). Brit. Baptist minister who started life as a factory worker; pastor of Westbourne Park Chapel (1877-1915); led Nonconformist opposition to Education Act of 1902.

Clifford's Inn. The oldest of the Inns of Chancery, in Fetter Lane, London.

Clifton. Suburb of Bristol, Eng.; has noted boys' public school; suspension bridge over Avon, 2-72 illus.

Climate. Typical atmospheric conditions of a region, 2-409; changes in Earth's climate, 2-516; and air conditioning, 1 82; continental, 6-472; effect on pop. of Africa, and Asia, 1-50, 1-288; deserts, 3-78; types of forest, 3-420; and ocean currents, 5-498; meteorology, 5-178; monsoon, 5-248, 4 210; modification of plant life, 6-217; rainfall 6-360. See also *Weather*.

Clinical thermometer, 7-268.

Clinker-built. See *Nautical Terms* (table).

Clinton Sir Henry. (c. 1738-95). Brit. general in War of Amer. Independence; commander-in-chief of Brit. land forces (1778-82).

Clio. In Gk. myth., Muse of history 5-299.

Clippers. Sailing ships, 7-20, 1-272.

Clipscham limestone, form of oolitic limestone, 4-510.

Clisthenes (klisthenéz) or *Cleisthenes* (6th cent. B.C.). Athenian statesman, democratic reformer; founded political organization of the Athenian Golden Age.

Clitus (klit'us) (d. 328 B.C.). Macedonian general and friend of Alexander the Great.

COBALT

Clive, Robert Clive, Baron (1724-74). Founder of Brit. Empire in India, 2-411, 4-252.

Cloaca Maxima. Great sewer of anc. Rome, a remarkable feat of engineering, 6-429.

Cloches. Miniature greenhouses, 5-130 illus.

Clocks and Watches, 2-412; chronometer, 2-383; eight-day movement, 2-416 illus.; pendulum, 6-115; regulated by radio, 6-350 illus.; 24 hour system, 7-279.

Cloete, Stuart (b. 1897). S. African writer, 7-92.

Clogs. Wooden-soled shoes, worn by some mill workers in N. Eng., 2-13. See also *Sabots*.

Cloisonné. Inlaid enamel-ware, 3-241, 4 352; Japanese vase, 3-243 illus.

Cloister, of monastery, 5-244.

Cloister and the Hearth, The (1861). Novel by Charles Reade one of the greatest historical novels, 6-386.

Close (klôz). Land and buildings within the precincts of a cathedral, reserved for the private use of the bishop and canons.

Close season, for angling, 3-384.

Clot. Continuous bar of clay in shape of the bottom of a brick; in brick-making, 2 60 with illus.

Cloth, 2 418; bleaching, 1-483; cells of textile fibres, 2-287; cotton, 2-516; dyeing and printing, 3-141; Jacquard loom, 4 356; lace, 4-429; linen, 4-511; loom, 5-36; nylon, 5-487; rayon, 6-368; silk, 7-53; spinning, 7-135; wool and cotton compared, 7-473.

Clothaire IV. King of the Franks (717-20); Charles Martel and, 2 309.

Clothes, 2-420; and hygiene, 4-224; Red Indian, 6 374; suitable for riding, 6-402; See also *Costume; Boots and Shoes; Hats and Caps*.

Clotho. In Gk. myth., one of the Fates, 3 343.

Cloth of Gold, Field of. See *Field of the Cloth of Gold*.

Clothworkers' Company, a London livery company, 4-326.

Clouded Border moth, 2-144 illus.

Clouded leopard. Rare leopard found in the Himalayas and Malaya, 4-484.

Clouded Yellow butterfly, 2-134 illus.

Clouds, 2-421; and Brit. weather, 5-179 illus.; electricity in, 4 504; formation of 1-80, 81; and temperature of earth, 5-180; and prehistoric earth, 3-150.

Clouds, The. Title of a play by Aristophanes, the great comic dramatist of ancient Athens.

Clouet, Jean (d. c. 1511). Fr. portrait painter, 3 439.

Clough (kluf), Arthur Hugh (1819-61). Brit. poet, typical, in his scepticism and introspection, of middle 19th cent. ("Say Not the Struggle Naught Availeth.")

Clout shooting, in archery, 1-207.

Clove hitch. Type of knot; how to tie, 4 124 illus.

Clover, 2-423; in crop rotation, 1-78; in orchards, 3-480.

Cloves, spice, 2-423, 7 131 illus.; oil of, 5-506.

Clovio (c. 160-511). King of the Franks, 3-449; converted to Christianity, 5-199; origin of name Louis, 5-40.

Clown, in Maric Innade, 4-132; in circus, 2-405 illus. f.

Club, 2-423; in London, 5-26; cycling clubs, 3-16;

Club moss, species of family *Lycopodiaceae* of mosses. Also known as staghorn moss.

Clubs. Suit in playing cards; and German acorn symbol, 2-221.

Clubs, Golf, 4-44, 46 illus.

Cluj. City of Rumania, formerly Kolozsavar; pop. 110,956; univ.; varied mfrs.; 6-470.

Clun Forest. Area of hills and moorland in Shropshire and Montgomeryshire, 7-44.

Clunias Benedictines. Order of monks founded in 910, 5-243.

Cluny. Tn. in E. cent. Fr.; remains of Benedictine abbey (910); seat of Cluniac or Congregation of Cluny.

Clutch, in motor vehicle, 5-277.

Clwyd, r. Denbighshire, Wales, 3-71.

Clwyd, Vale of, Flintshire, Wales; products, 3-389.

Clyde. R. of Scot., 106 m. long, 2-425, 6-510; Glasgow docks, 4-28.

Clyde, Firth of. Scot. estuary of r. Clyde, which expands into bay; 65 m. long, 1 m. to 37 m. wide; part of Greenock near head of the estuary; Ayr is on E. shore; isls. of Arran, Bute, Cumbrae, 2-428.

Clydebank, Scot.. Tn. in Dunbartonshire on r. Clyde, 54 m. N.W. of Glasgow; pop. 44,625; busy ship building centre, where the *Queen Mary*, *Queen Elizabeth*, etc., were built.

Clydesdale. Alternative name for Lanarkshire, Scot., 4-444.

Clymene (kl'm'en). In Gk. myth., mother of Phaeton.

Clynes, John Robert (1860-1919). Brit. Labour politician; lord privy seal and deputy leader of House of Commons in first Labour Government in 1924; home secretary (1929-31).

Clytemnestra (klit'mnest'ra). In Gk. myth., sister of Helen and wife of Agamemnon, whom she murdered, and mother of Iphigenia, Electra and Orestes, 1-67, 1-45.

Clytie (klit'i). In Gk. myth., maiden beloved and deserted by Helios, the sun, after whom she gazed till the pitying gods changed her into a sunflower.

Cnidus (n'd'us). Anc. Gk. city on promontory in Caria, Asia Minor, contained famous statue of Aphrodite by Praxiteles.

Cnosus. Anc. cap. of Crete. See *Knossos*.

Coach, state coach, 2-509 illus.; early railway, 6-356. See also *Road Transport*.

Coahuila [kôahwê'la]. Mex. state on N. bordering on Texas, U.S.A. 58,000 sq. m.; pop. 430,000; cap. Saltillo.

Coal and Coal-mining, 2-426, 3 487; coal reserves of world and Gt. Brit. 2-428; and coke, 2-447; coal mine, 6-217 illus.; coal-tar, 2-433; and gas production, 3-507; by-products by hydrogenation, 4-222; iron smelting, 4-293; in N. Amer., 5 454; oil from, 6-152; production in Ruhr, 6-168; safety lamp, 3-54 illus.; thickest soft-coal seam, 5-112.

Coal Board, National. See *National Coal Board*.

Coalbrookdale, Shropshire, England iron bridge, 2-66, 64 illus.

Coal-cutters, mechanical, 2-432.

Coal gas, for lighting, 4-443.

Coalition. Literally a process of fusion. Applied to a temporary union of forces by political parties of divergent opinions for some particular purpose.

Coal-tar and its products, 2-433 3-507.

Coalville. Tn. Leics, Eng., pop. 25,739 4-476.

Coaming. See *Nautical Terms* (table).

Coarse fish, angling for, 3-383; compared with game fish, 6-403.

Coast defence, guns in 2nd World War 1-260.

Coastguard, 2-434.

Coast Redwood. See *Wellingtonia*.

Coatbridge, Tn. in Lanarkshire, Scot. pop. 47,538, 4-444.

Coates, Albert (1882-1953). Brit. musician, born in Russia, conductor of Russian Imperial Opera, London Symphony Orchestra, Royal Philharmonic Society and Philharmonic Orchestra, N.Y.

Coates, Eric (b. 1886). British composer ("Country-side Suite," "London Suite" from which "Knight-bridge" march was chosen to introduce B.B.C.'s "In Town To-night,"

Coat of arms, in heraldry; origin of name, 4-165; 7-frontis.

Coats. Scot. family of threadmakers at Paisley; George Coats (1849-1918) was made Baron Glenanar.

Cobalt (Co). Hard white metallic element of the iron group; atomic no. 27; atomic weight 58.94, 2-434.

COBALT

3-224; radio-cobalt used in medicine, 4-302; effect on growth of sheep, 5-178 illus.

Cobalt, Mining tn. in Ontario, Canada; one of the world's chief sources of cobalt; silver mines, 7-56.

Cobalt blue, a pigment, 2-434.

Coban, Tn. in Guatemala, Cent. Amer., pop. 29,242, 4-101.

Cobb, John R. (1899-1952). Brit. racing motorist; on Sept. 16, 1947, set up speed record for measured mile at 194.198 m.p.h. Killed while attempting to break the world's water speed record.

Cobbett, William (1762-1835). Brit. writer and politician, 2-435.

Cobden, Richard (1804-65). Brit. politician; supporter of free trade, 2-435; friendship with Bright, 2-69.

Cobb (kdv). Formerly Queenstown; outer port of Cork, Irish Rep.; pop. 5,713, 2-436, 4-285.

Cobham, Sir Alan John (b. 1894). Brit. aviator; flew London-Australia and back (1925-26), London-Cape Town and back (1925-26); afterwards organized air displays; 1-12; pioneer of refueling planes in flight.

Coblentz (k'blents). Tn. in Land of Rhineland-Palatinate, W. Ger. Almost completely destroyed in 2nd World War. Was a busy wine-shipping port.

Cob-nut. Deciduous tree; a variety of hazel, 4-143.

Cobra. Large poisonous snake, native to Africa and S. Asia, 2-436, 7-75 illus.

Coburg, Ger. Mfg. town in Bavaria; formerly one of the dukedoms of Saxe-Coburg-Gotha; pop. 21,700.

Coca. Shrub from which cocaine is obtained; grown in Peru, 6-139.

Cocaine. A drug, 3-127; as anesthetic, 1-115, 7-195; production in Peru, 6-141.

Coccus. Kind of bacterium; round in shape, 1-313, 344.

Coccus cacti. Insect from which cochineal is obtained; breeding on thornless cactus, 2-158.

Coccyx (kok'siks). Small bone in the adult skeleton forming the tip of the spinal column below the sacrum.

Cochet (k'ohsh), Henri (b. 1901). Fr. lawn tennis player. In 1926 won Fr. championship and, with Brugnon, the Wimbledon men's doubles. In 1927 won Davis Cup (with Borotra) for Fr.; U.S. singles title and Wimbledon men's doubles, with Brugnon. Wimbledon singles champion 1927 and 1929; 4-462.

Cochin-China, part of Indo-China. Former Fr. colony, now included in the state of Vietnam, 4-256, 7-399.

Cochineal. Scarlet dyestuff obtained from scale insect *Dactylopius coccus*, 2-436, 3-141, 2-158; in red ink, 4-261.

Cochlea (kok'lee). Part of the ear, 3-118.

Cochran, Sir Charles Blake (1872-1951). Brit. theatrical manager and impresario; knighted 1948.

Coclo. Zapotec rain-god; urns representing, 1-334, 333 illus.

Cockaigne (kok'ain). Land of. An imaginary land of luxury, joy, and delightful feats; applied in literature to London.

Cockatoo. Bird related to the parrot, 2-437, 7-525 illus.; types of, 6-92.

Cockatrice. Heraldic animal, 4-164 illus. f.

Cockchafer. A large beetle (1 to 1½ in. long), very common in some parts of the continent of Europe, and very destructive to the foliage of fruit and forest trees.

Cockcroft, Sir John Douglas (b. 1897). Physicist; worked on development of radar and of the atomic bomb; since 1945 director of research in atomic energy; 4-299.

Coker, Edward (1831-75). Celebrated arithmetician, whose *Arithmetic* ran into 113 editions; this work gave rise to the saying "according to Coker," i.e. correct.

Cockermouth. Tn. of Cumberland, Eng.; pop. 5,234, 3-10.

Cocker Spaniel. Dog, 3-104, 3-101 illus. f.

Cockles and Mussels, 2-437, 7-24 illus. f.

Cockney. Term applied to Londoners and their peculiar accent, 2-438; rhyming slang, 7-65.

Cockpit, of aeroplane, 1-43 diag.

Cockroach. Insect of the order *Orthoptera*, 2-438, 4-269 illus.

Cocksfoot grass, 4-601.

Cocoa and Chocolate, 2-438, 1-51 illus.; 1-57 illus.; Gold Coast industry, 4-41.

Cocoa butter, 2-439, 441.

Coconut Palm and coconuts, 2-441, 5-487 illus.; shell, 6-528; coconut oil in margarine, 6-124; in Pacific isls., 6-29.

Cocoon, 2-136; of caterpillars, 2-263, 264, 4-268; of silkworm, 7-54.

Cocos Islands. 27 coral islets 600 m. west by south of Christmas Isl.; in 1955 parliament transferred the administration from Singapore to Australia for development of an international airport; 7-57.

Cocoteau (kok'tō), Jean (b. 1891). Fr. poet, essayist, novelist, and dramatist; shows many enthusiasms (surrealism, romanticism, classicism, etc.); novels include *Les Enfants Terribles* (1929); plays, *La Machine Infernale* (1934); films, *La Belle et la Bête*; *Orphée*; 3-156.

Cod. Marine edible fish, 2-442; habits, 3-379; fisheries, 3-380, 4-128; compared with haddock, 4-115; liver oil, 3-377, 7-104. *See also* Fish (table).

Coda. Final section of a musical composition, completing the design of the whole work yet not essential to it.

Codaine. Drug obtained from opium, 5-521.

Code Napoléon. Revised legal system of France, drawn up under Napoleon, 3-452.

Codes and Ciphers, 2-442.

Codex. Early vellum book (pl. codices) 2-2.

Codex Alexandrinus. Biblical MSS. of 5th cent.; origin of name, 2-3.

Codex Sinaiticus. MS. of Bible found in monastery on Mt. Sinai. Comprises whole of New Testament, and is written in Greek; discovery of, 2-3; purchase by Britain, 1-141, 110.

Codex Vaticanus. MS. of Bible in Vatican library, 2-3.

Codiell. Addition to a will, 7-150.

Codling moth. Apple-tree pest, 2-145.

Codlins-and-cream. *See* Willow-herb.

Cody (k'odl), Samuel Franklin (1861-1913). British aviator. Born in U.S.A., became naturalised Englishman in 1896; first man to fly in Gt. Brit., and maker of the first practical British flying-machine, 1-38.

Cody, William Frederick. *See* Buffalo Bill.

Co-education. School and college system of educating boys and girls together, 6-504.

Coefficient. In algebra, a number or known quantity which is used as a multiplier with a known or unknown quantity. In physics, a number indicating the degree of a quality possessed by a substance, e.g. coefficient of linear expansion.

Coelacanth (sel'akanth). "Living fossil" fish, 6-283, 282 illus.

Coelenterata (sel'en'teratal). Group of invertebrate animals, 1-154; hydra, 4-214; jelly-fish, 4-360.

Coello, Claudio (1630-93). Span. painter, 7-121.

Coelostat. Astronomical instrument. Consists of a mirror driven by clock-work to rotate about an axis in its own plane. It is pointed to the pole of the heavens and reflects continuously the same region of the sky into the field of view of a fixed telescope, 7-189 illus.

Coffee, 2-444; Reduin custom, 1-192; Brazilian exports, 2-47.

Coffer dam. A temporary dam built so that the enclosed space may be pumped dry to permit work, 3-30, 32.

COLIMA

Coggia's comet, 2-471 illus.

Cognac (k'onyak). France. Old town in s.w., famous for brandy which bears its name; pop. 17,500; on r. Charente.

Coheser. Device for detecting radio waves, 6-341.

Coil. In electricity, a wire conductor wound to form a coil or spiral. It can have a core of air or of a magnetic material. Its function is to produce electromagnetic effects, the value of which depend on the number of turns in the coil. Coils are the basis of the transformer, and of the field and armature windings of electric motors and generators.

Coimbra. Tn. in Portugal, pop. 98,883, 6-267; university, 6-268.

Coinage, of Britain, 5-223; bronze, 2-93; cupro-nickel, 1-115; Britannia figure on Brit. coins, 2-79 with illus., 5-233 illus. f.; Amer. decimal system, 4-358; of Irish Republic, 4-285 illus. *See also* Money.

Coir. Fibre obtained from coconut husk, 6-51, 2-412.

Coke (cook) Sir Edward (1552-1634). Eng. judge and politician; Speaker of the House of Commons, attorney-general, and chief justice; showed great brutality in prosecuting Sir Walter Raleigh.

Coke, Thomas, 1st Earl of Leicester (1752-1812). Eng. politician and agricultural reformer; improved breeds of sheep and cattle, 4-259.

Coke, 2-447, 3-187, used in blast furnace, 4-293.

Cola nuts, used in making cola drinks, 5-187.

Colburn, Zerah (1804-100). Amer. mathematical prodigy, 1-237.

Colchester, Essex, England; pop. 57,136, 2-447, 3-295.

Colchicum. Drug, 3-127.

Colchia. Dist. in Caucasus on shores of the Black Sea; and Golden Fleece legend, 1-226, 1-269.

Cold front, in meteorology, 5-180.

Cold-rolling mills, type of steel produced, 4-295.

Coldstream. Scot. historic border vill. on Tweed, near famous ford; Coldstream Guards are named from this place, 1-147.

Cole, George D. H. (b. 1889). Brit. economist; Chichele prof. of Social and Political Theory, Oxford Univ., from 1941. Wrote several works on economics, also detective stories, with his wife, M. I. Cole.

Coleoptera. Order of insects, including beetles, 4-270.

Coleraine (k'olrain). Tn. in co. Londonderry, N. Ireland; pop. 10,748, 5-34.

Coleridge, Hartley (1796-1849). Eng. poet and essayist, eldest son of Samuel Taylor Coleridge; as a poet, best known for a number of beautiful sonnets.

Coleridge, Samuel Taylor (1772-1834). Eng. poet, critic and philosopher, 2-448, 3-288; *The Ancient Mariner*, 2-149; and Southey, 7-102; and Wordsworth, 7-177.

Coleridge, Sara (1802-52). Brit. authoress, daughter of Samuel Coleridge; edited father's works; *The Months*, 5-255.

Coleridge-Taylor, Samuel (1875-1912). Brit. musical composer, half Negro, whose early death ended a most promising career; set to music Longfellow's *Havatha*, 5-35.

Colet, John (c. 1467-1519). Eng. scholar and divine; dean of St. Paul's from 1503; founded St. Paul's School, (1509); Bible lectures, 6-387; and church reform, 6-376; and Sir Thomas More, 5-262.

Coligny, Gaspard de (1519-72). French Huguenot leader, 2-453; and Henry of Navarre, 4-164.

Collin, Hendrik (1869-1914). Dutch statesman; prime minister, 1925-26 and 1933-30.

Colima (koléma), Mexico. State on cent. w. coast; 2,000 sq. m.; pop. 78,800; cap. Colima.

COLIN CLOUT

Col'in Clout. Poetic name for a shepherd or countryman, used esp. by Spenser 7-130.
Collar-bone (clavicula), in skeleton, 7-60, 1-141 diag.; bandage for fracture, 3-366 with illus.
Collateral. Property pledged as security for fulfilling financial obligations.
Collecting, 2-453.
Collective nouns, for groups of animals, 1-156.
College of Arms. Queen Victoria St., London, 4-165.
Collie. Breed of dog, 3-101.
Collier, Jeremy (1650-1726). Eng. nonjuring clergyman, writer of many controversial pamphlets; denounces theatre, 3-287.
Collier, John (1850-1934). Brit. artist; among his best-known paintings are "The Last Voyage of Henry Hudson," "The Laboratory," "The Cheat," and "Sentence of Death."
Colliery. See Coal and coal-mining.
Colling, Charles and Robert. Eng. farmers who improved cattle breeds, 1-78.
Collingwood, Cuthbert, Lord (1750-1810). Eng. sailor, 2-454, 7-304, 305.
Collins, Michael (1890-1922). Irish statesman; Sinn Féin member of House of Commons (1918-22); became head of provisional govt. of Irish Free State in Jan. 1922; killed in ambush, Aug. 22, 1922.
Collins, Wilkie (1824-89). Eng. novelist; friend of Dickens, 5-172; his stories hold the interest by reason of their excellent plots. *The Woman in White* (1860); *The Moonstone* (1868), forerunner of the detective story.
Collins, William (1721-59). Eng. poet ("The Passions"; "To Liberty"; "To Evening"); d. insane, 3-288.
Collinson, James (c. 1825-81). Brit. painter, one of the original seven of the Pre-Raphaelite brotherhood.
Colloidion. Pyroxilin (nitrocellulose with less nitrogen than the kind used for explosive) dissolved in a mixture of ether and alcohol, when brushed on a wound, it dries, leaving a protective film, 3-302; used in rayon manufacture, 6-368; medium for holding the silver salts on photographic plates, 6-181.
Colloids, 2-455.
Col'mar, Fr. Tn. of Alsace, at the base of the Vosges Mts.; pop. 46,000; cotton, brewing, metal industries.
Colne, r., in Essex, flows to North Sea, 35 m. long; oyster beds; 3-298.
Cologne. City of Germany, in Land of North Rhine-Westphalia, 2-456; 7-492. Eau de Cologne mfr., 3-156.
Cologne, Eau de. See Eau de Cologne.
Colombia. South American republic; area 440,000 sq. m.; pop. 11,015,200; cap. Bogotá, 2-457; and Panama, 6-53; flag, 3-385 illus. f.; boundary dispute with Peru, 6-139.
Colombo. Cap. of Ceylon; pop. 362,000, 2-459, 2-298.
Colo'n, Cristobal. See Columbus, Christopher.
Colón. Tn. in Panama; pop. 44,000, 6-53.
Colon. The large intestine; in digestive system, 3-90, 89 diag.
Colon, in punctuation, 6-309.
Colonel. See Money (table).
Colonel. Army officer. In U.K., rank above lieutenant-colonel, below brigadier. Rank indicated by a crown above two stars.
Colonial Office. Brit. govt. dept., h.q. of Brit. colonial administration, 4-52; careers in colonial admin., 2-238.
Colonna, Vittoria (1490-1547). Marchioness of Pescara; It. poet, friend of Michelangelo; one of most beautiful characters of It. Renaissance.
Colonsay. Isl. of the Inner Hebrides, Argyllshire, Scot.; area 17 sq. m.; pop. 384.
Colophony. See Rosin.
Colorado. State of U.S.A.; area 104,247 sq. m.; pop. 1,325,089; cap. Denver, 2-461.
Colorado Beetle (*Leptinotarsa decemlineata*). Pest of the potato crop;

notifiable if found; yellow in colour, with long black stripes on wing cases; common in the U.S.A. and Europe, its presence in the U.K. is kept in check by severe measures; 1-414; rate of reproduction, 1-154.
Colorado River, in S.W. U.S.A., remarkable for the famous Grand Canyon; flows to Gulf of California; with its chief headstream it flows for 2,000 m. 2-461; Hoover dam, 5-393, 3-33; scenery, 5-452.
Colorado Springs. Tn. in Colorado, U.S.A.; pop. 45,268, 2-461.
Colorimetry. Measurement of colours, 2-163.
Colossae [kolosá']. Anc. city in Phrygia, Asia Minor, early Christian Church.
Colosseum. Roman amphitheatre, 2-461.
Colossi. Giant statues of antiquity, 2-462.
Colossians, Epistle to the. The 12th book of the New Testament, addressed by Paul to the Christians at Colossae.
Colossus of Rhodes. One of the Seven Wonders of the world, 6-393, 7-2, 3 illus.
Colour. What we see and how we see it, 2-462; in birds' plumage, 1-170; in fish, 3-377; Impressionist painters and colour division theory, 4-237; effect on lenses, 4-182; and reflection of light, 4-198; Newton's study of, 5-109; peacock feathers, 6-100; protective coloration among animals, 6-296; polychromatic theory of vision, 2-461.
Colour, Trooping the. See Trooping the Colour.
Colour-blindness, 4-168, 3-29.
Coloureds. People of mixed blood in S. Africa, 7-90.
Colour photography, 6-165, 168 illus.
Colour printing, 6-292 illus. f.; Jap. work and artists, 4-351, 352 illus.
Colour problem in S. Africa, 1-51, 52.
Colours. Military, 2-165; in heraldry, 4-161 illus. f.
Colt, Samuel (1811-62). Amer. mfr., inventor of revolver, 3-358 illus.
Colt's-foot Plant (*Fusillago furfur*) of order *Compositae*; used in medicine as remedy for coughs; yellow flower-heads appear in Feb., enormous broad leaves in summer.
Colum, Padraic (b. 1881). Irish author, notably of children's books, 4-287.
Colum'ba or Colum, Saint (521-597). Irish missionary to Picts and Scots, also called Columkille ("Colum of the churches"), because of the great number of churches and monasteries he founded; monastery on Iona, 1-227.
Columbia, District of. See District of Columbia.
Columbia, South Carolina, U.S.A. (Cap. and seat of state univ., on r. Congaree; pop. 86,914, 2-215.
Columbia (from Columbus). The feminine personification of the U.S.A.
Columbia River. Formerly Oregon r. one of the largest rivers of N. Amer., 1,400 m. long, 5-152, 2-80, 2-196, 5-532; dams on, 7-123.
Columbia University, New York, 5-114 illus.
Columbidae. Zool. family of birds including pigeons and doves, 6-197.
Colombine. Dancer courted by Harlequin, in pantomimes, 4-132, 133.
Columbite, mineral containing tantalum, 7-224.
Columbium (element). See Niobium.
Columbus, Christopher (c. 1151-1506). Genoese navigator, discoverer of America, 2-467, 1-132, 7-98, 7-142; navigation, 5-341; and Isabella of Castile, 4-301; statue at Barcelona, 1-368; tomb at Seville, 7-5.
Columbus, Ferdinand (1488-1530). Son of Christopher Columbus, whom he accompanied on 4th voyage; wrote biography of father.
Columbus, Ohio, U.S.A. State cap., pop. 374,770; in cent. part of state on Scioto r., one of most important rly. centres in U.S.A.; 5-506.
Colvin, Sir Sidney (1845-1927). Brit. literary and art critic, keeper of

COMMINES

prints and drawings in Brit. Museum (1884-1912).
Combination locks, for safes, 4-536, 6-483.
Combinatorial Analysis, in maths., 5-148.
Combined Cadet Force, 2-158.
Combine harvester. Agricultural machine, 1-76, 77 illus.
Combining. A process in the preparation of wool, 7-174, 175 with illus.
Combustion, and explosives, 3-324, 329; as chemical chain reaction, 2-322; fire, 3-356; fuels and 3-486; and oxygen, 1-80, 81.
Comédie Française [ko'miédifranséz']. Famous Paris theatre, founded in 1680; also called Théâtre Français, home of the highest form of drama from the days of Molière, 5-232.
Com die Humaine, La. Series of novels by Balzac, 1-358.
Comedy, Aristophanes and, 1-228 (Greek, 3-116).
Comedy of Errors, The. Play by Shakespeare in which mistakes arise from likeness between twin brothers (Antipholus) and between their two servants (Dromio).
Comera; h. Mts. Co. Waterford, Irish Rep., 4-281.
Comet. Celestial body, 2-468; in solar system, 1-284.
Comet. Early passenger steamship, built for Henry Bell at Port Glasgow on the Clyde (1811-12).
Comet, jet-engined air liner built by De Havilland company, 1-34 illus 1-13, 41.
Comfrey. A coarse brookside plant whose flowers vary from pale yellow to red and purple; belongs to the order *Boraginaceae*.
Cominform. Communist Information Bureau, set up secretly at Warsaw Oct. 1947, by Communist parties of U.S.S.R., Bulgaria, Czechoslovakia, Poland, Rumania, Yugoslavia; the Dutch communist party joined in Dec.; in 1948 Yugoslavia was expelled and h.q. moved from Belgrade to Bucharest, in 1956 it was dissolved. See also Comintern.
Comino. Brit. isl. in Mediterranean part of colony of Malta, 5-98.
Comintern. Shortened form of "Communist International," and applied to the 3rd International (International Working Men's Association) set up at Moscow in 1919; dissolved in 1943. See also Cominform.
Comitajia. Lawless bands of Bulgarian fighters; raids in Macedonia, 5-63.
Comma, in punctuation, 6-309.
Comma butterfly, 2-139 illus.
Commander. Officer of Royal Navy ranking above a lieutenant-commander and below a captain; insignia 5-354 illus.
Commander-in-Chief (C.-in-C.). Formerly the highest position in the Brit. army, abolished in 1904; in war time the officer commanding an army in the field receives the title.
Commando. Swift-moving mounted troops used by Boers in Boer War 1-503; from 1910, shock troops of exceptional physique, specially trained in amphibious warfare; duties transferred to Royal Marines 1945.
Command performance. Theatrical or film performance given at the express request of, and in the presence of, the sovereign.
Commedia dell' arte. Type of Italian comedy which flourished chiefly in 16th and 17th cent.; with fixed plot and characters (Harlequin, Columbine, Pierrot, etc.), the acting and words were improvised at each performance; masks and mime were important, 4-132, 3-119.
Commensal. A living organism which forms partnership with another. See Symbiosis.
Commerce, careers in, 2-230, 236, 238.
Commercial art, as a career, 2-234.
Commercial travelling, as a career, 2-230.
Communes [komôn']. Philippe de (c. 1445-c. 1511). Fr. historian called "first truly modern writer" (*Memoirs*, one of classics of history

COMMISSION

Commission. In Brit. army, 1-252.
Committee of Public Safety. Group of Fr. revolutionists who ruled Fr. during the Reign of Terror, 3-469; Robespierre and, 6-415.
Commodore. Temporary rank in Brit. navy, between rear-admiral and captain; insignia, 6-354 illus.; in merchant navy, rank given to sealer master of a line; in air force (air commodore), rank between group captain and air vice-marshal.
Commodus, Lucius Aelius Aurelius (A.D. 161-192). Rom. emperor 180-192, son of Marcus Aurelius; a brutal tyrant, he was assassinated.
Common. Land subject to common rights, 2-473.
Common blue butterfly. 2-110 illus.
Common Guillemot. Bird; egg, 1-452 illus. f.
Common law. origin in England, 4-458.
Common Lizard. Native to Brit., 4-530, 520 illus.
Common Morel, a fungus. 3-488 illus. f.
Common Partridge. Bird; egg, 1-152, illus. f.
Common Prayer. Book of. *See* Prayer, Book of Common.
Common Quaking grass. 4 fronts.
Common Reed, grass. 4 fronts.
Commons, House of. in Brit. parliament, 4-50; establishment and development of, 5-200, 6-88, 89 illus., 3-277.
Common salt (NaCl). in mfr. of hydrochloric acid, 4-215.
Common Sandpiper. Bird; migration, 5-204 illus. f.
Common Tern. Bird; migration, 5-204 illus. f.
Commune, The (1871). In Fr. hist. a revolutionary régime set up in Paris after defeat of Napoleon III by Ger., 3-453, 3-459.
Communism. *See* Eucharist.
Communism. 2-474, 7-354; and atomic espionage, 1-305; Balkan strife, 1-350; in Hungary, 4-205; Lenin and Russian revolution, 4-178, 179; in Malaya, 5-97; Marx and The Manifesto, 5-139; in Russia, 6-176.
Community singing. 7-58.
Commutative law. in algebra, 1-108.
Commulator. In electrical apparatus; generation of direct current, 3-114 with diag.
Como (kömf). Beautiful lake in N. It. at foot of Alps, 554 sq. m., city of Como (pop. 53,200) at s. extremity, 4-304.
Comorin, Cape. India; southernmost point, 4-239.
Companion of Honour (C.H.). Brit. order, 5-530.
Companionway. *See* Nautical Terms (table).
Company. Unit in a battalion, it consists of three platoons in the Brit. infantry.
Comparative anatomy. evolutionary evidence from, 3-322.
Comparison. of adjectives, 1-19; of adverbs, 1-21.
Compass. In navigation, 2-474, 5-338; gyro-compass, 4-113.
Compass jellyfish. 1-157 illus.
Compass variation. and magnetic pole, 5-83.
Complex. In psychology; and emotion, 3-242.
Compline. Canonical hour, frequently sung as evening service in R.C. Church, 5-244.
Complutensian Polyglot, The. Edition of Bible printed in Latin, Greek and Hebrew, 1-443.
Composing. in printing books, 2-4.
Compositae. Botanical family of plants containing over 12,500 species, 5-126.
Compost. in gardening, 3-503.
Compound addition. In arithmetic, 1-17.
Compound leaf. Term used for a leaf divided into distinct leaflets, 4-471.
Compound-wound motor. 5-276.
Compressed air, brakes operated by. 5-279; pneumatic machines, 6-230.
Compression-ignition engine. *See* Diesel engine.
"Comptometer." Accounting machine, 2-168.

Comp'ton, Denis Charles Scott (b. 1918). Eng. cricketer; scored 1,000 runs when 18, in first season with Middx; in Australia 1946-47 scored century in each innings of Adelaide test; in 1947 his aggregate, 3,816, with 18 centuries, broke all records, and he took 73 wickets with slow left-arm bowling; an Arsenal footballer from 1935 to 1950; 2-530 illus.
Compton, Edward (1851-1918). Brit. actor, son of Henry Compton; founded the Compton Com'dy Company, long a leading touring company; Fay Compton, actress, is his daughter, and Sir Compton Mackenzie, author, his son.
Compton, Henry (1805-77). Brit. actor, excelled as a Shakespearean clown. Real name Charles Mackenzie.
Compton Wynates. Tudor manor house in Warwickshire.
Comrie. Holiday resort in Perthshire, Scot.; pop. 1,836, 6-138.
Comstock lode. Rich source of mineral wealth in Nevada, U.S.A., 5-393.
Comte [kavnt], Auguste (1798-1857). Fr. philosopher, founder of Positivist school of philosophy, 1-284, 6-160.
Comus [kōmus]. In late Gk. myth., god of revelry; in Milton's great poem, enchanter, son of Circe, who offers a brutalising draught to travellers to accomplish their ruin.
Comyn, John, the Younger (d. 1306). Claimant to Scottish throne, murdered by Robert Bruce, 2-96.
Concarneau. Fr. village in Brittany, 3-138 illus.
Concave mirror, image. 5-523 illus.
Concentration camps. in Boer War, 1-503; in Nazi Germany, 4-375.
Concepción [konsepshn]. Chile. City on Bilo-bio r.; pop. 92,361; trade centre for agric. region; 5 times destroyed by earthquake.
Concepción. Tn. in Paraguay; pop. 16,500, 6-76.
Concerto. in music, 5-305.
Conch (kongk) or concha. In architecture, term for the concave ribless surface of a vault; also an apse or the dome of an apse.
Conchos. R. of Mexico, 350 m. long, 5-186.
Concord. Cap. of New Hampshire, U.S.A.; pop. 27,984, 5-398.
Concord. Tn. of Mass., U.S.A., 20 m. N.W. of Boston. Noted for associations with Emerson, Thoreau, Hawthorne, and Louisa Alcott; first battle of War of Amer. Independence fought here; pop. 7,972; 1-137, 5-111.
Concordance. type of dictionary, 3-88.
Concordat of 1929. Pope estab. as ruler of Vatican state, 4-316.
Concrete. 2-476; in bridge design, 2-62; from foamed slag, 6-305; reinforced concrete buildings 1-112, 219; Roman, 1-209.
Concussion. first aid for, 3-368.
Condé, Louis I de Bourbon, prince of (1530-69). Fr. general and Languenot leader; and Coligny, 2-453.
Condé, Louis II de Bourbon (1621-86). Called The Great Condé. Fr. general; won victory of Rocroy, 1643, which ended Span. military predominance; in Bourbon family, 2-28.
Condell, Henry (d. 1627). Actor of Shakespeare's company, 7-15.
Condensed milk. 5-206.
Condenser. in engineering, 2-479, 7-153.
Condenser (in electricity). *See* Capacitor.
Condenser microphone. 5-194 illus.
Condensing hygrometer. *See* Dew-point hygrometer.
Conder, Charles (1868-1909). Brit. artist, painter of fans, 3-340 illus. f., 3-273.
Condillac [kawndēyak], Étienne Bonnot de (1715-80). Fr. philosopher; member of French Academy, 6-160.
Condiments. *See* Spices.
Condor. Vulture, 2-479; wing feather, 3-344.
Condorcet [kawndorsā], Marie Jean Caritat, Marquis de (1743-94). Fr. mathematician, philosopher, and revolutionist; as member of Legislative Assembly laid foundation of Fr. educational system.

CONNACHT

Condottieri. Soldiers of fortune in Italy, 13th to 15th cents., 4-313.
Conductance. The property of a material by virtue of which it allows an electric current to flow through it.
Conduction. in theory of heat, 4-147.
Conduction. of electricity; through liquids, 4-278; through gases, 4-277.
Conductor. A material that offers low resistance to the passage of an electric current; that part of an electric transmission, distribution or wiring system which actually carries the current, 3-210.
Conductor, of orchestra. 5-528.
Conduit. *See* Architectural Terms.
Cons. In mathematics, volume of, 5-170.
Cons. of a volcano, 7-404-405 illus. f.
Cons. cells. of eye; sensitivity to light, 2-332, 331.
Cons. of trees; common types, 2-183 illus. f.; in reproduction, 3-184; of prehistoric plants, 3-395.
Coney. Rabbit fur, 6-328.
Coney Island. seaside resort of New York City, of which it is a part.
Confederate States of America. States which broke from the U.S.A. in 1860-61, and fought the Amer. Civil War against the North. They were S. Carolina, N. Carolina, Georgia, Florida, Mississippi, Alabama, Louisiana, Texas, Arkansas, Tennessee, and Virginia. Jefferson Davis was their president and Lee their great general, 4-471.
Conference. Variety of pear, 6-100.
Confession. in Rom. Cath. Church, 6-127.
Confirmation. Church services, 2-479; in Church of Eng., 2-387.
Confucius (c. 551-478 B.C.). Chinese philosopher, 2-479; his teaching, 2-366, 1-270.
Conger eel. 3-172.
Congo. R. of Africa, length over 3,000 m., 2-180, 1-49; explored by Stanley, 7-145.
Congo, Belgian. Central Africa, 2-481; 901,998 sq. m.; pop. 11,126,487; cap. Leopoldville, 2-181; Leopold II and, 1-55, 4-185; Stanley's expedition, 7-145; copper production, 2-503; industrial gem stones, 1-56, 3-83; native war dances, 1-58 illus.
Congregational Church. Religious denomination, 3-163, 6-312, 2-381.
Congress. The legislative branch of the govt. of U.S.A., composed of Senate and House of Representatives, 7-361.
Congressional Medal of Honour. Highest U.S. award for military valour, 5-530.
Congreve, William (1670-1729). Eng. dramatist, one of greatest writers of comedy; plots are intricate, characters often gross and heartless, but brilliant (*The Double Dealer*; *Love for Love*; *The Way of the World*), 3-121, 3-287.
"Congreves" hatches. An improved type of "huffers"; disadvantages, 5-147.
Conic projection. in map-making, 5-118, 119 diag.
Conifers. Cone-bearing trees, 2-483, 7-308; coniferous forests, 3-121.
Cunningham [kun'ingham], Air Marshal Sir Arthur (1895-1948). Australian airman; his record flight Cairo to Kano won him A.F.C. in 1925; A.O.C. Western Desert, 1941-43; A.O.C.-in-C. 2nd Tactical Air Force, 1944; lost life in air crash Jan. 1948.
Con'iston. L. in Lancashire, 4 m. W. of Hawkehead; 54 m. long; on its shores are houses where Ruskin and Tennyson resided, 4-438, 439.
Coniston Old Man. Mt. in Lake dist., Eng., 2,635 ft., 4-438.
Conjugation. Grammar, 7-390.
Conjunction. Grammar, 2-484, 4-55.
Conjunctiva. of eye, 3-331 with diag.
Conjunctive adverbs. in grammar, 1-21.
Conjuring. 2-485.
Conker. Seed of horse-chestnut, 4-198.
Connacht (or Connaught). Smallest province of Iro., in W. Irish Republic. Area 6,611 sq. m.; pop. 500,339; 4-281, 284.

CONNATE

Connate. Bot. term for opposite leaves joined at their base, 4-471.

Connaught [kon'awt]. Arthur, Duke of (1850-1942). Eng. prince, 3rd son of Queen Victoria; gov.-gen. of Canada (1911-16); father of Lady Patricia Ramsey, and of Prince Arthur of Connaught (1883-1938) who was gov.-gen. of S. Africa (1920-24).

Connaught (Ireland). See **Connacht**.

Connecticut [konet'ikut]. State of the U.S.A.; area 5,009 sq. m.; pop. 2,007,280; cap. Hartford, 2-486.

Connecticut river, U.S.A., 370 m. long 5-397.

Connolly, Marc. Pen-name of Marcus Cook (b. 1890). Amer. dramatist. (*Green Pastures*, an imaginative play based on Negro idea of Heaven and the Old Testament won him Pulitzer prize, 1930).

Connemara's. Picturesque mountainous dist. in Galway, Irish Rep.; has many fine bays and lakes, 4-281.

Connolly, Maureen (b. 1935). Amer. tennis player; youngest Wimbledon champion (1952), 4-462. Again champion, 1953, 1954.

Conrad. Holy Roman Emperors. For list see **Holy Roman Empire**.

Conrad II (c. 900-1039), emperor, founder of Salian line; crowned emperor 1027; increased strength of German monarchy.

Conrad III (1093-1152), emperor. Founder of Hohenstaufen line.

Conrad IV (1228-1254), emperor, son of Frederick II; became king in 1237, 4-7.

Conrad, Joseph (1857-1924). Anglo-Polish writer, 2-486, 5-473, 8-291.

Conscription. Compulsory military service, 1-245-248, 7-186. See also **National Service**.

Consequent poles, of magnet, 5-82 diag.

Conservation of Energy, Law of, 3-243.

Conservatives. Brit. political party, 2-487; Prime League, 6-288.

Consistory. Highest ecclesiastical court of R.A. Church, composed of cardinals.

Consols. See **Stock Exchange Terms**.

Constable, John (1778-1837). Eng. painter, 2-487, 3-260, 6-31; The Cornfield, 3-268 illus.

"**Constable's country**," term for valley of the r. Stour, 7-182 illus.

Constance, Council of (1111-18), 2-380 illus.

Constance or Konstanz, Ger. city in *Land* of Baden-Württemberg, on L. Constance at efflux of Rhine; pop. 31,000.

Constance, Lake (Bodensee), on N.E. frontier between Switzerland and Germany, formed by the Rhine; divides into two arms, the Untersee and the Oberlingersee; 6-390, 7-211.

Constantine II (642-668). See under **Byzantine Empire** (rulers).

Constantia, Rumania. Port on Black Sea; pop. (est. 1945) 79,700; Anc. Tomi or Constantiana Ovid's place of exile, 6-467, 470 illus.

Constantine I (The Great; c. 280-337). Rom. emperor 306-337, 2-488; founded Constantinople, 2-118; division of Rom. empire, 6-439; and Christianity, 2-379; 5-198; adoption of the cross, 2-535; and Jerusalem, 4-363; architecture, 1-210; triumphal arch, 6-447 illus.

Constantine IV (618-685). See under **Byzantine Empire** (rulers).

Constantine V, Copronymus (719-775). See under **Byzantine Empire** (rulers).

Constantine VI (717-797). See under **Byzantine Empire** (rulers).

Constantine VII, Porphyrogenitus (905-958). See under **Byzantine Empire** (rulers).

Constantine VIII (c. 960-1028). See under **Byzantine Empire** (rulers).

Constantine IX, Monomachus (c. 1000-55). See under **Byzantine Empire** (rulers).

Constantine X (1007-87). See under **Byzantine Empire** (rulers).

Constantine XI (1404-1453). Last of Byzantine emperors, 1448-53, 2-149.

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Constantine I (1868-1923), king of Greece; succeeded, 1913; abdicated, 1923; 4-78, 7-483.

Constantine, Algeria. Fortified city on natural citadel in N.E.; pop. 118,774; leather, woollens; Rom. remains; rebuilt A.D. 313 by Constantine, 1-109.

Constantinople. Cap. of the Byzantine Empire, the anc. Byzantium; refounded by Constantine in A.D. 330, 2-148, 4-303, 7-125 illus.; for modern city see **Istanbul**.

Constantinus (c. 250-308), Rom. emperor; father of Constantine the Great.

Constant Tin Soldier. The. Story by Hans Andersen, 1-145.

Constellation. In astronomy, 2-489; and zodiac, 7-524.

Constitution. Organic law or principle of govt. of a nation or society, usually in written document; Brit., 2-151, 4-50.

Consulate. In Rome 2 consuls held office for one year; held supreme command of armed forces, and presided over the senate. In Fr. consulate three consuls held office for 10 yrs., 1799-1804. Power was in hands of First Consul who was advised by Second and Third Consuls. Napoleon became First Consul, 1799, and Consul for life, 1802; 5-319.

Consuls. Ruling magistrates in anc. Rome; 6-430.

Consumption. See **Tuberculosis**.

Consumption. In economics, 3-159.

Contact lenses, 7-126 with illus.

Contact mines, in naval warfare, 5-219.

Contact printing, in photography, 6-182.

Contango. See **Stock Exchange Terms**.

Continent. A great land mass of the earth's surface. Counting Asia and Europe as one continent, the geographical continents are: (1) Europe and Asia; (2) Africa; (3) Australia; (4) N. America; (5) S. America; (6) Antarctica.

Continental Congress (1774). In U.S. history, 1-137.

Continental Divide. Watershed in Rocky Mt. region between streams flowing to Atlantic and those flowing to Pacific.

Continental Shelf, in physiography, 6-186, 5-494; Brit. Isles on, 2-85; oil from, 6-152.

Continental System. Napoleon's boycott of British trade, started by Berlin Decrees (1806), to which Britain replied by blockade. System collapsed from 1811; 5-322.

Continuity studio, of broadcasting service; announcer's work, 6-348.

Continuous-strip process of steel production, 4-293, 294 illus.

Contour map, 5-119, 120 diag.

Contract Bridge. Card game, development of the game of bridge, first played in U.S.A. in 1912, in London 1919, but not generally played in Gt. Brit. until 1929.

Contralto, in singing, 7-57.

Control-room, of broadcasting studio, 6-348.

Control tower. At airports, 1-87.

Convection, in theory of heat, 4-147.

Convent. Community of nuns, 5-245, 485.

Convention. The. Fr. assembly (1792-95), 3-451; and Committee of Public Safety, 3-469; and Louis XVI, 5-43.

Converter. In electricity, a machine for converting D.C. current into A.C. current or vice versa.

Convex mirror, image, 5-523 illus.

Conveyors, mechanical, 2-491; in coal mine, 2-432, 431 illus.; pneumatic tube carrier, 6-230, 231 diag.

Convocations. Annual assemblies of clergy in Church of England, 2-386 illus.

Convolution of Broca. Brain-cells governing speech, 1-180.

Convolvulus. Genus of twining plants, 2-494.

Convoys, in 2nd World War, 1-295 293 illus., 7-488 illus.

Conway, William Martin Conway, 1st Baron (1856-1937). British traveller, scholar and explorer.

Con'way or Aberconway, Wales. Spt. tn. in Caernarvonshire, 13 m. N.W. of Bangor; pop. 8,769; famous castle, 2-160.

Conway by-pass engine, type of jet engine, 4-371.

Cooch Behar. Princely state of India, added to W. Bengal in 1950, 1-429.

Cook, Frederick Albert (1866-1940). Amer. traveller; false North Pole claim, 2-296.

Cook, Captain James (1728-79). Eng. navigator and explorer, 2-484; and Australia, 1-317, 7-398; voyage in Antarctic, 6-244; chronometer used by, 2-384; explorations in Pacific, 6-29; and tattooing, 7-230.

Cook, Thomas (1802-92). Famous Brit. travel agent; started rly. excursion trips in 1811; his son John Mason Cook (1831-1909) joined the firm, which became Thom. Cook and Son in 1872. Nationalised as part of British Railways 1948.

Cook, Mt. South Island, New Zealand, highest point in Southern Alps (12,349 ft.), 5-422.

Cooke, Sir William (1806-79). Brit. electrician; with Wheatstone built first Enz telegraph line.

Cookery, 2-495; on camp fire, 2-193; meals, 5-151; by high-frequency currents, 3-223, 4-175.

Cookery books, 2-498.

Cook Islands or Hervey Archipelago. In S. Pacific; 111 sq. m.; annexed to New Zealand in 1901; 6-28, stamp, 6-30 illus.

Cook Strait. Between N. and S. Is. New Zealand.

Cooktown. Chief port of N. Queensland, Australia. Centre of cane-sugar dist.; pearl and béche-de-mer fisheries; pop. 500; 6-324.

Coogardis. Tn. in W. Australia, in important gold-mining region, 7-442.

Coolidge, Calvin (1871-1933). Thirtieth President of U.S.A. Vice-president to Harding, succeeded him on his death in 1923; president by election 1925-29.

Coolidge, William David (b. 1874). Amer. scientist; researched at Massachusetts Institute of Technology and General Elec. Co.'s labs. on X-rays, cathode rays, etc.; invented X-ray generator, tungsten filament lamps; and Coolidge tube, 7-324.

Coolidge tube, 7-507 illus.

Coolie. Asiatic labourer, 2-499.

Cooper, Sir Alfred Duff. See **Norwich Viscount**.

Cooper, Sir Astley Paston (1768-1841). Brit. surgeon and anatomist; portrait, 5-164; operated on George IV 7-194; at Guy's Hosp. from 1800.

Cooper, Gladys (b. 1888). Brit. actress; made name in popular plays and mus. comedy; 1917-33 in management at Playhouse Theatre, London appeared in serious plays (*Last of Mrs. Cheyney*) and in films.

Cooper, James Fenimore (1789-1851). Amer. novelist, writer of adventure stories, 2-499, 2-356, 7-364.

Cooper, Samuel (1609-72). Enz miniature painter; 3-258 illus.

Co-operative Societies, 2-499.

Co-ordinates, in geometry, 3-518 with diag.

Coorg. State of Rep. of India; area 1,593 sq. m.; pop. 249,255; cap. Mercara, 4-241.

Coot. Water-bird common in Enz black, with white bar across wings and white bald spot on forehead; toes are edged with a scalloped membrane; 6-353 with illus.

Coots, Sir Eyre (1726-83). Eng. gen. victories over Fr. in India, 4-252.

Copaacabana. Tn. in Bolivia, on Lake Titicaca; 1-508 illus.

Copaacabana. Suburb of Rio de Janeiro, Brazil, 6-403.

Copal resins, 4-107, 6-388.

Cope, Sir John (d. 1760). Eng. general commander-in-chief in Scotland 1745; defeat at Prestonpans (1746) 4-335.

Copenhagen. Cap. of Denmark; pop. 927,404; 2-500, 3-72, 73 illus.

Copenhagen, Battle of (1801). Nelson victory at, 5-363.

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Copernicus, Nicolaus (1473-1543). Polish astronomer, 2-501, 1-281, 282.

Cophetua. Legendary African king who made a beggar maid his queen. Story is subject of painting by Burne-Jones in the Tate Gallery, and of poem by Tennyson.

Coping. See Architectural Terms.

Copley, John Singleton (1737-1815), a leading painter of the Anglo-American school; born Boston, U.S.A., settled in London; R.A., 1779; fine historical paintings and, in America, portraits.

Coppée [kop'pé], **François Edouard Joachim** (1842-1908). Fr. poet, dramatist, and novelist; wrote about everyday life and working people.

Coppélia [kop'pé'lyä]. Ballet to music by Delibes; choreographer Saint-Léon; prod. 1870; danced by Adeline Genée; a classic of the Sadler's Wells repertory.

Copper (Cu). A reddish metallic element; atomic no. 29; atomic weight 63.57; 2-502, 3-224; and acids, 1-12; alloys, 1-114, 115, 116; Alaskan yield 1-88; in Arizona, 1-239; in bronze, 2-92; melting point, 2-44; origin of name, 3-20; primitive workings, 5-108 illus.; in U.K. coinage, 5-223.

Copper Age. In history of primitive Man, 5-109.

Copperas, ferrous sulphate, 7-187.

Copper beech, supposed origin of, 1-410.

Copper butterfly, egg, 3-171 diag.

Copperplate handwriting, 7-501 with illus.

Copper sulphate (blue vitriol), 3-221, 7-187.

Copra. Dried coconut kernel, 2-412, 6-494 illus., trade in Pacific, 6-29.

Coptic Church, in Abyssinia, 1-6; in Egypt, 3-175.

Copying inks, ingredients, 4-262.

Copyright. The exclusive right of property of an author, composer, or artist to produce or reproduce his works. Duration is for life of author and 50 years after. Berne international copyright convention, 1886, covers all countries except U.S.A.

Copy-taster, on a newspaper, 5-403.

Coquelin [kòk'lan], **Benot Constant** (1811-1909). Fr. actor; most famous role, Cyrano de Bergerac. A great comedian, wrote on acting. Called Coquelin aîné (elder); brother Alexandre (1848-1909) was Coquelin cadet (younger).

Coquet [kòk'et], r. in Northumberland, Eng., flowing to the North Sea; 10 m. long.

Cor. See Weights and Measures (table).

Coracle. Welsh boat made of skins, 1-501, 7-413 illus. f.

Coral. Marine polyp with limy skeleton, 2-504, 5-128; coral atolls, 6-28; mushroom coral, 3-frontis.

Coral clavaria, a fungus, 3-488 illus. f.

Corallina, a red seaweed; in coral reefs, 1-105.

Coral Sea. Part of Pacific Ocean N.E. of Australia, named from numerous coral islands; Allied naval victory over Japan, May 1942.

Coram, Thomas (1668-1751). Brit. sea captain and philanthropist; estab. a Hospital in Hatton Garden in 1741 for founding children. Famous portrait by Hogarth, 2-353.

Cor anglais. Reed instrument, 5-307, 7-473.

Corbel. See Architectural Terms.

Corbett, James John (1866-1933). Amer. boxer; beats Sullivan, 2-30.

Corbière Lighthouse, Channel Is., 2-303 illus.

Corchorus. Annual plant from which mite is obtained, 4-389.

Cordate. Name given to a heart-shaped leaf, e.g. sweet violet, 4-471 illus.

Corday, Charlotte (1788-93). Fr. revolutionary heroine; assassination of Marat, 2-469, 5-120.

Cordelia. In Shakespeare's *King Lear*, the youngest and favourite daughter of Lear, 4-409.

Cordeliers [kòrd'el'èr]. Fr. revolutionary club, founded by Danton, 1790; first to demand a republic; popularised motto "Liberty Equality, Fraternity"; leaders guillotined in 1794, 5-120.

Cordillera [kòrdil'èra] (Span. "rope" or "chain"). Great mountainous mass in W. N. Amer. and S. Amer. extending from Alaska to Cape Horn, 5-453, 456. Term applied originally only to the Andes.

Cordite. An explosive, invented by Sir Frederick Abel and Sir James Dewar, 1889, 2-330.

Cordoba [kaw'dòba], Argentina. City in N. centre, on Rio Primero; pop. 351,544; univ. (founded 1813); exports livestock, wool, hides; observatory, 1-223.

Cordoba or Cordova. City in S. Spain, on the Guadalquivir; pop. 148,990; founded by Romans; makes textiles, silver filigree work, cordovan leather, 7-104; university, 5-200; Span. mosque, 7-113 illus.

Cordoba, Caliphate of, in S. Spain; founded by Moors in 8th cent., with city of Cordoba as centre and 8 other cities subject to its monarch.

Cordoba. See Money (table).

Cordouan Lighthouse, Fr. Earliest rock lighthouse, A.D. 800, 4-502.

Cordova (Spain). See Cordoba.

Cor'duroy, ribbed cloth; used in mfr of clothing.

Corella, or Bare-eyed Cookatoo, 2-437.

Corelli [kòrè'l'è], **Marie** (1864-1924). Brit. novelist; wrote melodramatic romances with moral tone; *Romance of Two Worlds* (1886) brought her fame, other books incl. *The Sorrows of Satan* (1895), *The Mighty Atom* (1896), *The Master Christian* (1900).

Corfu [kòrfò] or **Kerkira** (anc. Corcyra). Gk. Isl., one of the Ionian Is.; area 227 sq. m.; cap. Corfu (pop. 32,200). Pop. of Isl. 114,600.

Corgi, Welsh. See Dogs (table).

Coriander. A spice, 7-132; oil used in medicine, 5-500.

Corinna (about 500 B.C.). Gk. lyric poetess, famous for her beauty and victory over Pindar in five poetic contests.

Corinth or Corinthus. City of Greece, called New Corinth to distinguish it from anc. ruined city; almost destroyed by earthquake in 1928; pop. 6,000.

Corinth Canal. Connecting the Gulfs of Corinth and Aegina, 2-207.

Corinthian order of architecture, 5-532, 531 illus.; monument at Athens, 4-81 illus.

Corinto. Principal port of Nicaragua; pop. 5,066, 5-430.

Coriolanus, Gaius Marcius (5th cent. B.C.). Rom. patrician who, according to legend, in revenge for slights led an enemy army against Rome, but relinquished vengeance at pleas of his mother and wife; basis of Shakespeare's *Coriolanus*.

Corium. Body of the hide used for making leather, 4-466.

Cork. Cap. of co. Cork, Irish Republic; pop. 74,577, 2-505, 4-281.

Cork. Bark of cork trees, 2-505, forests in Portugal, 6-267; as insulating material, 2-118.

Cork Harbour. Splendid landlocked basin of Irish Repub.; 1 m. wide at the entrance, with extreme breadth of 8 m.; contains Great Island, on which stands Cobb (Queenstown).

Cork oak. Evergreen tree, a species of oak, 2-505.

Corkwood. See Balsa.

Cormorant. Sea bird, 2-506; compared with shag, 7-11; feeding of young, 1-469; fishing in China, 2-367 illus.

Corn. Name given in a general sense to cereals and the grain produced by them; in U.S.A. applied to maize in particular; harvest, 4-134, 7-459 illus., 460. See Cereals, Maize, Wheat, etc.

Corn. Horny thickening of the skin.

Corn-bunting, bird, 2-125.

Cornrake, bird; migration, 5-204 illus. f.

Cornes, of eye, 3-331 with diag.

Cornéille, Pierre (1606-84). Fr. dramatist, creator of Fr. classical tragedy. *Le Cid* (1636), first Fr. stage master-

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piece; *Horace* (1639), *Cinna* (1640), *Polyeucte* (1640), *La Mort de Pompée* (1641); themes; individual versus circumstances, duty versus passion; 3-118, 455.

Corne'lia (2nd cent. B.C.). Rom. matron, daughter of Scipio Africanus, mother of the Gracchi. "These are my jewels," she said, showing her children to a friend who asked to see her ornaments.

Cornelian. A coloured variety of quartz, 6-320.

Cornellius, Peter von (1783-1867). Ger. painter; revived mural painting and founded Munich school.

Cornelius Nepos (c. 90-24 B.C.). Rom. historian (*De viris illustribus* much used as school text book).

Cornell University, Ithaca, New York state. A leading univ. of U.S.A. Founded 1865; benefactor Ezra Cornell (1807-74).

Cornet. See Stock Exchange Terms.

Cornet, musical instrument, 5-307, 7-322.

Cornett. Anc. horn instrument 5-309

Cornflower, 2-507.

Corn Laws. In Eng. hist., a series of laws extending from 1336 to 1848, placing restrictions upon grain trade, 3-12; Bright and anti-Corn Law campaign, 2-69; Cobden and 2-435; famine in Ireland, 4-262; abolished by Peel, 6-105.

Corn marigold. Weed found in cornfield, 5-126.

Corno, Monte. Mt. of the Apennines (9,580 ft.), 1-182.

Corn poppy, symbol of dead in World Wars, 6-260.

Cornwall. Co. of England, area 1,365 sq. m.; pop. 345,612, 2-508; china clay industry, 2-377; hurley game, 4-211; place names, 5-315; tobacco, 7-288; Watergate Bay 3-249 illus. f.

Cornwall. City in Ontario province Canada; pop. 16,899.

Cornwall, Duchy of. Crown property inherited by the eldest son of every British sovereign, situated in Cornwall, Devon, and London; the duchy was created in 1337, 2-508.

Cornwallis, Charles Cornwallis, Marquess (1738-1805). Brit. general, whose surrender at Yorktown in 1781 ended War of Amer. Independence 1-139, defeat of Tipuoo Sahib 4-252.

Corn'well, John Travers (1899-1916). Heroic boy sailor who, mortally wounded at the battle of Jutland (1916), gallantly continued at his post; he died two days later; awarded V.C. posthumously.

Corolla. Petal structure of a flower 3-399.

Coromandel coast, i.e. coast of India; Eastern Ghats and Fr. settlements, 4-240.

Corona. Of sun, 7-190; and eclipse, 3-158.

Coronado, Francisco Vazquez (c. 1500-45). Sp. explorer of N.W. U.S.A.; and the cities of Cibola, 1-134.

Coronary arteries, 4-145.

Coronation, 2-509; of Elizabeth II, 3-234, 235 illus.; manor of Addington and cookery rights, 2-495; lace designed for, 4-432 illus. f.

Coronation chair, in Westminster Abbey, London, 2-509 illus.; as example of medieval workmanship, 2-400.

Coronation Stone, in Westminster Abbey, 2-510, 6-138.

Coronel [kòrònel'], Chile. Spt. 25 m. N. of Concepción; naval battle, Nov. 1, 1914, in which Brit. cruiser squadron under Admiral Cradock was defeated by Germans under Admiral von Spee, 7-180.

Coroner's jury, functions of, 4-388.

Coronet. Small crown, worn as a head-dress on state occasions by the nobility, and varying according to the rank of the wearer.

Coronet. Of horse, 4-196 diag.

Corot, Jean-Baptiste Camille (1796-1875). French painter, 2-518, 3-440.

Corozo or Tagua nuts, vegetable ivory from, 5-487, 4-332.

CORPORAL

Corporal. Non-commissioned officer in Brit. army and R.A.F., ranking next below a sergeant; in R.A.F., insignia, 6-462 illus.

Corporal technician. In R.A.F., insignia, 6-462 illus.

Corporation. A body of persons (corporation aggregate) vested by law with the power to carry out certain acts; examples are the B.C.C., municipal corporations; there are also corporations sole, such as a bishop.

Corporations, Chamber of. Fascist parliament of Italy, 3-342.

Corps. A formation of troops of all arms consisting of two or more divisions; in Brit. army, 1-253.

Corpus Christi, Feast of, and religious drama, 3-117.

Corpus Christi College, Cambridge University, 2-182.

Corpus Christi College, Oxford University, 6-17.

Corpus juris civilis (body of civil law), compiled by Justinian (183-565).

Corpuscles, red and white, in blood stream, 1-489; and ultrasonics, 7-311.

Correggio [korre'jō], Antonio Allegri (1494-1534). It. painter, master of use of light and shadow and of flesh painting, 4-320, 6-386.

Corregidor [korre'jōdr], Philippine Is. Fortified Is. in Manila Bay. Occupied by Japan 1912-44. Ceded by U.S.A. to republic of the Philippines in 1947.

Corrib [kōrrib], Lough. Second largest lake of Ire., in cos. Galway and Mayo, Irish Republic; nearly 70 sq. m. in area; contains numerous small isls.

Corrida. See Bull-fighting.

Corrosion. The wearing away of metals or other materials by chemical reaction or electrolysis, as in the formation of rust. In some manufacturing processes acids are used as corrosive agents, as in the etching of copper plates with nitric acid, or of glass with hydrofluoric acid; anticorrosive alloys, 1-115.

Corrosive poisons, types of, 6-235.

Corrosive sublimate. See Mercuric chloride.

Corsairs. Barbary coast pirates; war against Christian ships, 5-200, 1-110.

Corsica. Mt. Kirkcudbrightshire, Scot., 2,668 ft., 4-415.

Corsica. French Is. in Mediterranean; area 3,307 sq. m.; pop. 267,873; cap. Ajaccio, 2-512.

Corsican pine, tree, 6-204.

Cort, Henry (1740-1800). Brit. inventor of ironmaster, 4-260.

Corte-Real [kōrtā' rēal], Gaspar (c. 1450-c. 1501). Port. explorer; discovered Newfoundland (1501), 1-134.

Cortés, Hernando (1485-1547). Spanish conquistador, conqueror of Mexico, 2-513, 5-188; and Aztecs, 1-134.

Cortes. Name for parliament in Spain and Portugal.

Cortex. Any outer layer, such as the bark, rind, or outer coverings of plants, and the outer rind of any tissue or structure of the human or animal frame.

Cordisone. Extract from the bile of oxen, used in treatment of arthritis. Also synthetically prepared from an African vine, *Strophanthus*, 3-127; 4-28.

Cortot [kōrtō], Alfred (b. 1877). French pianist, born Switzerland; foremost pianist of French school.

Corundum. Oxide of aluminium, 1-129, as gemstones, 7-165.

Corunna [korun'na] or *Coruña*, Sp. spt. on N.W. coast; pop. 112,096; sailing port of "Invincible Armada" (1588); repulse of Fr. by Brit. under Sir John Moore in Pontenar Wai in 1809, 6-117, 5-259; harbour 7-108 illus.

Corvette, a small sailing warship; name revived for a type of escort vessel in 2nd World War.

Corvidae [kōr'vidē]. Crow family, including raven, rook, jackdaw, magpie, jay.

Corybantes [koriban'tēz]. Mythical attendants of goddess Cybele whom

they honoured by frenzied dancing in mountains and woodlands to the sound of flutes, tambourines, and cymbals.

Cosgrave, William Thomas (b. 1880). Ir. statesman; Pres. of Dáil Éireann 1922, and re-elected 1927 and 1930. Leader of Opposition 1932-14.

Cosham. Suburb of Portsmouth, Hants 6-265.

Cosimo, Piero di (1462-1521). It. painter, 4-320.

Cosmati work. A decorative art created by the Cosmati family in Rome in 12th and 13th centuries; inlay made by combining mosaics, porphyry, marbles, etc., found in ruins of Rome; used in architecture, church interiors, and furniture.

Cosmetics. See Make-up.

Cosmic Rays. Intense radiation falling upon the earth from outer space and consisting chiefly of charged particles. The bulk of the radiation is absorbed by the upper layers of the earth's atmosphere, 6-339 10; recorded by instruments attached to balloons, 6-319 illus.

Cosack, H.M.S. Brit. destroyer; under Capt. P. L. Vian rescued 299 Brit. seamen from the Ger. prison ship *Thetis*; took part in second battle of Narvik in 1940; May 1941 in action against *Thetis*; on Nov. 10 of that year sunk in Atlantic.

Cossacks. People of mixed Slav and Tartar descent, 2-514, 5-146; invasions into Russia, 6-174.

Costa Rica. Central American republic; area 19,695 sq. m.; pop. 794,081; cap. San José, 2-514, 2-292, 293; map, 2-292; flag, 3-385 illus. f.

Costello, John Aloysius (b. 1891). Irish statesman; member of Fine Gael party; prime min., 1918-51, and again from 1951.

Costermonger. In London a seller of fruit, vegetables, or fish, from a barrow; origin of word, 1-186.

Costes, Dieudonné (b. 1892). Fr. aviator. Made first non-stop flight Paris-New York, in Sept. 1930.

Cost-of-living index. Published monthly by the ministry of labour; use to commerce, 5-234.

Costume, Bulgarian, 2-120 illus.; Czech, 3-22 illus.; Dutch, 5-377, 373 illus.; dolls as 16th cent. mannequins 3-101; gloves 4-35; Greek, 4-83 illus.; hats and caps, 4-136; Hindn., 1-273 illus.; Japanese, 4-349 illus.; jewelry, 4-372; Lichtenstein, 4-491 illus.; Mongolian headress, 5-237 illus.; Spanish, 7-110 illus.; Tibetan, 1-273 illus. See also Boots and Shoes; Clothes.

Cosway, Richard (1712-1821). Most brilliant Eng. miniature painter of his day; painted Mrs. Fitzherbert, Mme. Du Barry, and other ladies of fashion, 3-254.

Côte d'Azur. Fr. part of the Riviera, 6-103.

Côtes-du-Nord. Dept. of Brittany, France, 2-91.

Cotman, John Sell (1782-1812). Eng. painter, 2-515, 3-262; Greta Bridge, 3-261 illus. f.

Cotopaxi [kōtōpak'sē], Mt. Active volcanic peak, S. Amer., in the Andes, in Ecuador (19,500 ft.), 3-160.

Cotrone [kōtrō'nā] (anc. Crotone); Spt. of S. It. on Gulf of Tarento; pop. 10,000; exports oranges, olives, liquorice; most famous medical school of anc. Gk. world.

Cotswold Hills. Range in western counties, mainly in Gloucestershire Eng., 4-34, 3-217, 248; Box tunnel, 7-328.

Cotswold sheep, 7-22.

Cotter, Patrick. Irish giant; height, 4-17.

Cotton, (Thomas) Henry (b. 1907). Eng. golfer; open golf champion in 1931, 1937, 1918, 4-44.

Cotton, Sir John (1679-1731). and Brit. Museum Library, 2-88.

Cotton, Sir Robert (1571-1631). Eng. antiquary; and Brit. Museum Library, 2-88.

Cotton and cotton manufacture, 2-516, 7-434 illus.; in Assyria, 1-338;

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bleaching, 1-481; cellulose in, 2-288; Egyptian production, 3-175; Liverpool cotton exchange, 4-525; Manchester trade, 5-111; mercerised cotton, 5-171; and U.S.A., 7-358; and boll weevil, 7-135; compared with wool, 7-173 with illus.

Cotton boll. Seed capsule of cotton plant, 2-516.

Cotton-gin. Seeding machine used in preparing cotton fibre, 2-518.

Cottonopolis. Name sometimes given to Manchester, 5-111.

Cotton plant, 2-516.

Cotton rep. cloth, 2-419 illus.

Cotton Worm moth, cxx, 3-171 diag.

Coty, René (b. 1882). Fr. statesman; president of Fr. from 1954.

Cotyledon [kōtīl'ēdōn]. Seed leaf of plant, 6-528, 4-470, 2-24.

Coubertin, Pierre de (1863-1937). Fr. nobleman, and Olympic Games, 5-510.

Couch grass, 4-frontis.

Coué [kō'ū], Émile (1857-1926). Fr. physician; specialised in auto-suggestion; his famous formula was "Every day in every way I get better and better."

Cougar. See Puma.

Coulomb [kō'lob], Charles Augustin (1736-1806). Fr. physicist; founded mathematical theory of electric and magnetic action; practical unit of electric quantity was named after him; enunciated "Coulomb's law" of electric attraction.

Coulomb. The unit of quantity of electricity. It is defined as the amount of electricity carried by a current of one ampere flowing for one second.

Coumarin. Crystalline substance derived from sweet clover and other plants; used in perfumes and flavours.

Council of Europe. "Parliament" of W. Europe, consisting of (1) Office of Ministers and (2) Consultative Assembly; reps. from Belgium, Denmark, France, Irish Rep., Italy, Luxembourg, Netherlands, Norway, Sweden and U.K.; first meeting at Strasbourg in Aug., 1949.

Council of Ten (1310-1797). Tribunal of 10, afterwards 17, which governed republic of Venice.

Council of Trent. See Trent, Council of.

Council schools, origin of name, 6-501

Counter. See Nautical Terms (list)

Counterfeiting. Crime of making imitations of coins or paper money 5-223; in the Middle Ages it was punishable by death.

Counterpoint, in music, 5-303.

Counting, numerals, 5-475.

County. A subordinate political division into which the United Kingdom and certain other countries are divided; some cities are counties of themselves, e.g. London.

County court. Brit. court of law, 2-21

County Hall, London, h.g. of the London County Council, 5-24 illus.

Coup d'état. Bold or brilliant stroke of statesmanship, usually unconstitutional and often accompanied with violence.

Couperus, Louis (1863-1923). Dutch novelist whose stories combine tragic sense with fine style; *Old People* and *The Thims That Pass* (1906).

Couplet, in poetry, 6-234.

Coupon (Fr. *coupon*, to cut). Detachable portion of document, etc., esp. a dated certificate attached to a bond or other commercial instrument, entitling holder to collect interest due.

Courbet [kōrbē], Gustave (1819-77). Fr. landscape, figure, and portrait painter, founder of modern realist school, 3-440.

Coursing. Chasing hares with greyhounds. Dogs run in pairs, with a judge following on horseback. Chief annual event is the Waterloo Cup held at Ascot, Liverpool.

Courtauld, Augustine (b. 1904). Brit. explorer; during 1930-31 Arctic Expedition in Greenland remained on ice plateau alone for five months.

Courtauld, Samuel (1793-1881). Brit. manufacturer, born in U.S.A.

COURTAULD INSTITUTE

founded the crêpe silk (rayon) manufacturing firm of Courtaulds.

Courtauld Institute of Art. London. Founded 1931 at No. 20, Portman Square—a fine Adam house—by Samuel Courtauld (1876-1947). A department of London university. It was the first academic institution in the U.K. for art history studies, 6-33, 1-14 illus.

Court cards. In playing cards, 2-221.

Court Circular. Daily publication in London, recording the movements of royalty and society people. Founded 1856; combined temporarily (1911) with *Court Journal* (1829-1923).

Court Martial. Court which tries offenders against military, air force or naval law. Courts-martial are divided into (1) District C.M., (2) General C.M., (3) Field General C.M. Only a Field General C.M. of three officers, or a General C.M., can pass sentence of death. There is a right of appeal against C.M. findings.

Courtois (koortwah), **Bernard** (1777-1838). Fr. chemist, discoverer of iodine, 4-276.

Court plaster. Sticking plaster made of silk gummed and mixed with a healing admixture; so called from former use by ladies of the court as "beauty plasters."

Courtrai (koortrá), Belgium tn. on r. Lys; pop. 40,000; fine linen and lace; "Battle of Spurs" (1302). French beaten by Flemings.

Courts of Justice. 2-620. Henry II's reforms, 4-162; Privy Council 6-292; House of Lords, 6-100.

Cousin (koozun), **Victor** (1790-1867). Fr. philosopher, originator of historical doctrines; reorganized Fr. education system, 1832-18, 6-160.

Cousins, Samuel (1801-87). Brit. mezzotint engraver; used mixed method of engraving and etching; made fine copies of paintings by Reynolds, Lawrence, Gainsborough.

Couter. In armour, 1-211.

Coutts (koots), **Thomas** (1735-1822). Brit. banker, one of the founders of the great London banking business of Coutts and Co.

Cove. See **Architectural Terms**.

Covenant, Ark of the. Sacred chest of acacia wood which Israelites took with them into Palestine; contained two stone tablets on which Ten Commandments were inscribed; placed by Solomon in temple at Jerusalem.

Covenanters. In Scot., the dissenters bound by oath or covenant to maintain Presbyterianism; first covenant signed 1557 at inspiration of John Knox; covenant of 1638, signed at Greyfriars' Church, Edinburgh, to resist introduction of Laud's prayer-book; Montrose and, 5-256.

Covent Garden. London, formerly "convent garden" of Westminster Abbey, now spacious square noted for its vegetable, fruit, and flower market. Royal Opera House opened in 1658.

Coventry. City of Warwickshire, Eng.; pop. 258,211, 2-522; motor-car industry, 3-249; "to send to Coventry," origin of phrase, 2-522; and 2nd World War, 7-189 illus.

Coverdale, Miles (1488-1568). Augustinian friar, Bishop of Exeter, translator of first complete printed Eng. Bible (1535); helped to edit Henry VIII's "Great Bible" (1539), 1-143.

Coverley, Sir Roger de, simple, kindly whinical country gentleman in the *Spectator* of Addison and Steele, 1-16, 7-154.

Cow, eye. 3-333 illus.; milk from, 5-205; sacred to Hindus, 4-241 illus.; sacred to Isms, 4-301; tongue, 7-291.

Coward, Noel (b. 1899). Brit. actor-playright, and composer. Plays etc. include *Hay Fever* (1924), *Bitter Sweet* (1929), *Pirate Lie* (1930), *Cavalcade* (1931), *Blithe Spirit* (1941); of films *Brie Encounter* (1945) is notable.

Cowboys. In Arizona, 1-230; of Chile, 2-360 illus.; Mexican, 5-187, 188 illus.; as a nomadic type, 5-446.

Cowdenbeath. Tn. in Fife, Scot.; pop. 13,153, 3-350.

Cowen, Sir Frederick Hymen (1852-1935). Eng. composer and conductor, producer of many cantatas, operas, oratorios, and anthems.

Cowes. spt. on S. coast of Isle of Wight; headquarters of the Royal Yacht Squadron; pop. 17,154; 7-449, 509 illus., 510.

Cowley, Abraham (1618-67). Eng. poet and essayist; sonorous lyric style; love verses *The Mistress* (1647); *Pindaric Odes* and the *Davidic*, a scriptural epic.

Cowper, William (1731-1800). Eng. poet, 2-622; Olney hymns, 4-226, 3-288.

Cowpox. a disease, and vaccination, 7-373.

Cowrie shell. 5-235 illus., 7-24 illus., 1.

Cowslip. Perennial plant, 2-523.

Cow-trees. of S. American forests, 7-313.

Cox, David (1783-1839). Eng. landscape painter, in water colour and oils; 3-262.

Cox's Orange Pippin. Variety of apple, 1-185.

Coxswain, or cox. in rowing, 6-160.

Coyote (koif'yo'te or koif'ol), the prairie wolf (*Canis latrans*), 7-165 with illus.

Coytel, Noel (1628-1707). Fr. religious and historical painter; influenced by Poussin; his son **Antoine** (1661-1722) and others of the family were noted painters.

Cozens, Alexander (c. 1698-1786). Eng. painter, 3-261.

Cozens, John Robert (1752-97). Eng. painter, 3-261.

Crab. A crustacean, 2-523; eye, 3-333 illus.; foot, 3-113 illus.

Crab constellation. See **Cancer**.

Crab-apple. The wild apple common in Brit. In several forms; the Siberian crab is often grown in gardens; as parent of modern apple, 1-185.

Crabbe, George (1754-1832). Eng. poet, curate of Aldeburgh, Suffolk; wrote realistic "novels in verse"; *The Village* (1783), *Parish Register* (1807), *Tales of the Hall* (1817). His *The Borough* (1810) was basis of Britten's opera *Peter Grimes*.

Crabbing. See **Aeronautics** (table).

Crab-spider. 7-135.

Cracking. Process in oil refining, 6-151.

Cracow (krakh'koff). City in s. Poland on r. Vistula; machinery and chemical indus.; pop. 330,016; 6-238, flower sellers, 6-241 illus.

Craig, (Edward) Gordon (b. 1872). Brit. actor and author; son of Ellen Terry; founded school of theatrical art 1913 in Florence. Cr. C.H. 1956.

Craigavon, James Craig, 1st Viscount (1871-1940). Irish politician; took part in the Boer War and 1st World War; premier of N. Ire. from 1921; created a viscount in 1927.

Craigie, Sir William (b. 1867). Brit. philologist; joint-editor of *New English Dictionary* (Oxford); wrote *An Historical Dictionary of American English*.

Craigleith. Is. off coast of E. Lothian, Scot., 5-40.

Craig y Llyn. Mts. in Glamorganshire, Wales; 1,970 ft., 4-7.

Craik, Mrs., pen-name of Dinah Maria Mulock (1826-87). Eng. novelist and children's story writer; *John Halifax, Gentleman* (1856).

Cramond. Is. off coast of W. Lothian, Scot., 5-40.

Cramp. in muscles; how caused, 5-298.

Cransach (krakh'nakhk). Lucas (1472-1553). Ger. painter and engraver; founder of Saxon school; portraits of Luther and all Ger. reformers and princes of Reformation period; also scriptural and mythological subjects.

Crane, Walter (1845-1913). Brit. artist and craftsman; illustrated children's books; a follower of William Morris.

Crane. In engineering, 2-524; brakes used in, 2-54.

Crane. A bird, 7-168, 169 illus., 1.

Crane fly. 4-269 illus.

CREPE RUBBER

Cranford. Novel by Mrs. Gaskell, 3-510; and Kuntstford, 2-328.

Cranium. Brain case of skull, 2-10, 7-64.

Cranmer, Thomas (1489-1556). Eng. archbishop and martyr, 2-526; and Henry VIII, 4-161; and Prayer Book, 6-280.

Cranwell. Village in Lincs, Eng.; R.A.F. College at, 4-512.

Crashaw (krash'shaw), **Richard** (1613-49). Eng. poet; fled to Fr. in Civil War and turned Rom. Catholic; poem mystical, show much lyric beauty; collection *Steps to the Temple* (1646); 3-285.

Crassus, Marcus Licinius (c. 115-53 B.C.). Rom. general and statesman; supported Sulla against Marius; suppressed Spartacan rebellion; in first triumvirate with Pompey and Caesar, 60 B.C.; 2-161.

Craters. of moon, 5-257, 258 illus.; of volcano, 7-104-405 and illus., 1.

Crawfish. salt-water crustacean; it is rather larger than the lobster, and is found round the coasts of Brit.; distinguished from crayfish, 2-527, 5-129 illus., 1.

Crawford, Francis Marion (1854-1909). Amer. novelist, b. and lived much in It.; *Mr. Isaacs*, story of Anglo-Indian life; later novels, almost exclusively It. in subject and setting (*A Roman Singer*, *A Chronicle Maker's Romance*), 7-365.

Crawl. in swimming, 7-207, 209 illus.

Crayfish. Fresh water edible crustacean, 2-528.

Cream. centrifugal force in separator, 2-293.

Cream. To protect laundry workers' hands against germs, 4-454.

Cream-bordered Green Pea Moth. 2-114 illus.

Cream. centrifugal force in separator, 2-293.

Cream. To protect laundry workers' hands against germs, 4-454.

Cream-bordered Green Pea Moth. 2-114 illus.

Crease. In cricket, 2-328.

Creasy, Sir Edward Shepherd (1812-78). Brit. barrister, chief justice of Ceylon (*Eighteen Decisive Battles of the World*).

Creation. Creation story in the Bible, 1-15.

Crécy, Battle of (1346). 2-527, 4-201. Black Prince, 1-180.

Credit. in book-keeping, 2-11.

Creek Indians. Tribe of Amer. Indians; architecture, 6-371 illus.

Creepers. family of birds; types, 5-486, egg, 3-171 illus.

Crees. Tribe of Plains Indians, N. Amer., living mainly about Lake Winnipeg and Saskatchewan river.

Creffield. See **Krefeld**.

Creighton (kri'ton), **Mandell** (1843-1901). Brit. clergyman and historian, appointed Bishop of London in 1896 (*The An of Elizabeth History of the Papacy*).

Crémazie, Octave (1827-79). French-Canadian poet, 2-203.

Crème de Menthe (krém de mawntl). Green liqueur made in Fr. Peppermint flavour, with high alcoholic content.

Cremo'na. It. city on r. Po; pop. 61,000; famous for 16th cent. school of painting, 6-232.

Cremona Gardens. Former London pleasure resort at Chelsea from 1845-77; circus entertainments, 2-404.

Crenate. Bot. term for leaves with rounded serrations, 4-471.

Creole (kre'ol). Name used in s. U.S. and Latin Amer. for pure-blooded descendants of early Fr. Sp., or Portuguese settlers; incorrectly used for a mulatto; in New Orleans, 5-400.

Creolin. Antiseptic derived from coal-tar.

Creon. In Gk. myth., brother of Queen Jocasta and King of Thebes and Antigone, 5-505.

Creosote. Distillate of coal-tar, preservative of wood, 2-434.

Cripe. a gauzy fabric, either silk or cotton.

Cripe rubber. manufacture, 6-465; as shoe soles, 2-16.

CRESCENDO

Crescendo. See Musical Terms (table).
Creosol. Antiseptic distilled from wood or coal-tar.
Cress. Plant of mustard family; grown for use in salads.
Cresta Run. Artificial ice-run for toboggans at St. Moritz, Switz., constructed 1885.
Cretaceous period. In geology, 3-615, 518.
Cretan bull. In Gk. myth., captured by Hercules, 4-168.
Crete. Gk. isl. in Mediterranean; area 3,235 sq. m.; pop. 463,459; cap. Candia, 2-527; cession to Greece, 4-78; anc. Cretan and Aegean civilization, 1-22; alphabet, 1-120; in mythology, 7-268, and 2nd World War, 7-490; map, 498.
Croix de la Neige. Highest peak of Jura mts. (5,654 ft.), 4-387.
Cretinism. Condition of defective physical and retarded mental development; thyroid gland and, 4-28.
Crestons. A strong, printed cotton fabric, used as furnishing fabric; rarely glazed or calendered; originally a white cloth made in Fr. and named after its manufacturer.
Cressa. In Rom. myth., wife of Aeneas, 1-25.
Crestot [kré'sò], Lc. Tn. in v. cent. Fr., 75 m. N.W. of Lyons; pop. 24,100; great Schneider munitions factory.
Créant, Battle of (1433). In Hundred Years' War, 4-204.
Crévasse. In glaciers, 4-25.
Crewe, Robert Olfrey Crewe-Milnes, 1st Marquess of (1853-1945). Brit. statesman. Liberal leader in House of Lords; lord-lieut. of Irv. (1892-5); sec. of state for India (1910-15); sec. of state for war (1931).
Crewe. Important rly. tn. in Cheshire; pop. 52,415; locomotives, rails, and rolling stock.
Crichton [krí'ton], James (1500-82). "The Admirable Crichton." Scottish scholar, adventurer, and swordman of proverbial versatility.
Crichton-Browne, Sir James (1840-1938). Brit. physician; specialist on nervous disorders.
Crocket. Game, 2-528; bats, 7-451 illus., 455. Bradman, 2-38; See also Cricket Records, p. 270.
"Crocket," in darts, 3-51.
Crocket. Insect, 2-531; chirping and hearing organs, 4-264.
Crief [krí'f]. Tn. in Perthshire, Scot., 18 m. W. of Perth; noted as a health resort; has large hydropathic establishment; pop. 5,473; 6-138.
Criflet. Mt. on coast of Kirkcudbright-shire, Scot., 1,866 ft.; 4-415.
Crima, criminal courts, 2-520.
Crimina. Peninsula in Black Sea; part of Ukraine S.S.R.; area 23,400 sq. m.; pop. 2,150,000; 2-531; and 2nd World War, 7-491.
Crimean War (1854-56). 2-532; Balaklava, 1-348; contact mines used by Russians, 6-219; Florence Nightingale, 5-437; Nicholas I and, 6-431; rockets, 6-422.
Criminal Investigation Department (C.I.D.). work of, 6-251.
Crimson Glory. Variety of rose, 6-452 illus. f.
Criekie Crags. Mt. in Lake dist., Eng., 2,816 ft., 4-438.
Crinoid or sea lily. An echinoderm animal, early type of sea life.
Crinoline. Wire frame supporting a wide skirt; 19th cent. fashion, 2-421.
Crippen, Hawley Hervey (1862-1910). Anglo-Amer. criminal; arrest for murder notable for use of wireless.
Crippleplate. One of the city gates of London, taken down in 1762, 5-19.
Cripps, Sir Stafford (1889-1952). Brit. lawyer and Labour politician; solicitor-gen., 1930-31; ambassador to Moscow, 1940-42; mission to India, 1942, 4-254; pres. of Board of Trade, 1945-47; chancellor of exchequer, 1947-50.
Cris'pin, St. Christian martyr of late 3rd cent.; patron saint of shoe-makers. Festival, Oct. 25.
Cristobal. Port of Panama Canal zone at Atlantic entrance to canal; pop. 326, 6-58.

CRYPTOMERIA

Cristofori [krí'stò'faw'rì], Bartolommeo (1655-1731). It. harpsichord maker; invented piano, 6-194.
Critic, The (1779). Satirical comedy by R. B. Sheridan, 7-26.
Critical angle, and total internal reflection of light, 4-500.
Critical size. In nuclear fission; of uranium, 1-300, 301 diag.
Criticism, literary, early 19th cent., 3-290.
Croatia. A republic of Yugoslavia; pop. 3,756,807; cap. Zagreb, 7-518, 519 map.
Croatia-Slavonia (krò'shìe slávò'nià). Part of Yugoslavia, formerly of Hungary; 4-207.
Croats. Slavic race-group, 7-66.
Croce [krò'chè], Benedetto (1866-1952). It. philosopher; wide influence on modern idealistic philosophy; 4-330, 4-100.
Crochet [krò'shì]. A kind of knitting or lace-making done with silk, wool or cotton, by using hooked needle.
Crocket, in architecture. An ornament on the angles of eaves, canopies, etc.
Crocket, Samuel Rutherford (1860-1914). Scot. novelist, for some time a Free Church minister (*The Stickler Minister*).
Crocodile. Carnivorous reptile, 2-532; compared with alligator, 1-113; egg, 3-171 diag.; summer hibernation, 4-173; leather, 4-469 illus.
Crocodile River. See Limpopo.
Crocodylia. Zool. order of crocodiles and alligators, 6-388.
Crocos. Flower, 2-533, 3-400.
Croesus. King of Lydia (560-516 B.C.), 2-533; and Aesop, 1-15.
Croix de Guerre. Fr. decoration, 5-530.
Cro-Magnon [krò'magnòn]. Race of Stone Age men, 2-282, 5-106.
Cromarty [krum'ar'tì] Firth. Arm of Moray Firth, Scot.; 19 m. long, average breadth 4 m.
Cromdale Hills. Morayshire, Scot., highest point Carn Eachie (2,329 ft.), 5-261.
Crome, John (1768-1821). Eng. landscape painter and etcher often styled "Old Crome" to distinguish from his son John Benay Crome (1794-1812); 3-260; "Moonlight on the Yare," 3-269 illus.
Cromer, Evelyn Baring, Earl of (1841-1917). Brit. statesman and diplomatist; as Brit. agent, 1883-1907 reorganized Egyptian govt.; called maker of modern Egypt.
Cromer. Holiday resort on Norfolk coast, pop. 4,658, 5-148.
Cromlech, group of huge stones set up by Stone Age men.
Crompton, Richmal. Pen-name of Richmal Crompton Lamburn (b. 1890); Brit. author; creator of William, the schoolboy hero of *Just William*, etc.
Crompton, Samuel (1753-1827). Brit. inventor of spinning mule, 2-533, 7-136.
Cromwell, Oliver (1599-1658). Eng. puritan soldier and statesman, Lord Protector of the Commonwealth, 2-533, 3-278, 280; New Model Army, 1-248; and Scotland, 6-512; reconquest of Ireland, 4-282; support from Mazarin, 5-151; and Ely, 3-237; and Hunts, 4-210; his watch, 2-418.
Cromwell, Richard (1626-1712). Son of Oliver Cromwell; Lord Protector (Sept. 1658-May 1659).
Cromwell, Thomas (1485-1540). Earl of Essex, Eng. statesman; confidential servant to Cardinal Wolsey and agent of Henry VIII in effecting Eng. Reformation; supplanted Wolsey; became lord great chamberlain in 1539; beheaded for treason in 1540.
Cronin, Archibald Joseph (b. 1896). British novelist. Author of *Hatter's Castle*, *The Stars Look Down*, *The Citadel*, etc.
Cronje [kròn'je], Piet (c. 1840-1911). Boer general; captured the Jameson raiders, 1896.
Cronos or Kronos. In Gr. myth. Titan ruler of Universe, 7-370.
Crook. Tube inserted into brass instruments to change key, 4-194.

Crooked cross. See Swastika.
Crookes, Sir William (1832-1919). Brit. chemist and physicist; invented Crookes tube; discovered thallium, 7-261.
Crop. The first of a bird's three stomachs; stores food and prepares it for digestion by the other two; largest in grain-eating birds and missing in fruit- and insect-eaters.
Crop rotation, in agriculture, 1-78.
Croquet. Game, 2-534.
Cross. Symbol, 2-535, 2-536; and mistletoe legend, 5-228.
Crossbill. A type of finch, seen in Eng. in winter; named from the way its mandibles cross, 3-352.
Crossbow. Weapon, 1-207 with illus.; influence on warfare, 4-118.
Cross Fell, Eng. Mt. (2,930 ft.) in Cumberland, one of the chief peaks in the Pennine Range, 10 m. N.W. of Penrith, 3-9.
Cross-stick. Early navigational instrument, 5-311.
Cross-stitch, embroidery, 3-239 illus.
Cross-wind landing. See Aeronautics (table).
Crotalinae, the pit viper family of snakes, including the rattlesnakes.
Crotona. Anc. name of Crotone (q.v.).
Croton oil. Purgative drug obtained from a plant of the spurge family.
Crouch, r. Essex, Eng., 35 m. long. Hurham-on-Crouch port at mouth, 3-298.
Group, of horse, 4-196 diag.
Crow. Bird, 2-536.
Crowfoot family, of plants, includes water-crowfoot, 7-429 with illus. See also Buttercup.
Crowland Abbey, Lincs, Eng.; bells at 1-125.
Crown, in Brit. constitution, 4-50, 2-51, 2-521.
Crown. An Eng. silver coin, worth 3 shillings, not regularly minted since 1902.
Crown or Koruna. See Money (table).
Crown or Korne. See Money (table).
Crown Colonies, British, 2-84.
Crown green. In bowls, 2-29.
Crown Jewels, 2-536, 7-301. 2-frontis stolen by Blood, 1-493.
Croydon. Tn. in Surrey, contiguous to London; pop. 249,592, 7-198, 5-27.
Crozier. Bishop's pastoral staff.
Crozierae [krò'si'èr-è], extensive plant family. Includes the *Brassicae* (cabbage, turnip, cauliflower, etc.).
Crucifixion, The, in story of Jesus, 4-367.
Cruden, Alexander (1701-70). Compiler of *Biblical Concordance* (1737).
Crude oil, formation in shale, 6-147.
Cruft's. Popular name for Cruft's Great International Dog Show Society. Founded 1886 by Charles Cruft (1852-1934), 3-103.
Cruikshank [kròok'shank], George (1792-1878). Brit. caricaturist, etcher and illustrator; illustrated Dickens' *Sketches by Boz* and *Oliver Twist*.
Cruikshank, Isaac (c. 1756-1811). Brit. caricaturist and painter; Dr. Johnson at the Thrales's, 4-380 illus.
Cruiser. Warship, 5-344, 347 illus.
Crummuck Water. Lake in Cumberland among the mts., 2 m. long, 1 m. broad, 4-439.
Crusades, 3-1, 6-46, 7-388; and cult of St. George, 3-520; capture of Jerusalem, 4-363; Gennoa and, 3-513; Richard I and Third Crusade, 6-398; Saladin, 6-488; Constantinople, 2-149.
Crushed stone, in quarrying; uses, 6-320.
Crusoe, Robinson, 3-2; book by Defoe, 3-85.
Crustacea. Class of heavily armoured arthropod animals, 4-269, 1-154.
Crux. For orux ansata, armless, etc. See Cross.
Cruzairo. See Money (table).
Cryolite. Natural compound of sodium aluminum and fluoride; in aluminum extraction, 1-128; deposit in Greenland, 4-95, 1-220.
Cryptogams. Flowerless plants which reproduce by means of spores, 6-529.
Cryptomeria japonica. See Japanese sypress.

CRYSTAL

Crystal. Substance that has solidified so that its constituent atoms are arranged in a definite geometrical pattern, the crystal faces are an outward expression of the regular arrangement of the atoms. Most solid substances in their pure form have their distinctive crystalline structure. 3-4 Crystal detector is the popular name for a crystal rectifier. It consists of a fine wire (cat's whisker) in contact with a crystal of galena and has the property of allowing electricity to pass in one direction and of suppressing it in the other. It was used as a detector in early radio receivers. Another electrical use of the crystal is the germanium transistor for amplifying current. Crystal in radio microphone, 5-194. In piezo electricity, 6 196. In snow, 7-77.

Crystallisation, process, 3-5

Crystallography, and X rays, 7 508

Crystal microphone, 5-194 piezo electric effect, 6-196

Crystal Palace. Building of iron and glass designed by Sir Joseph Paxton and erected in Hyde Park London for Great Exhibition of 1851, 3 127 with illus., re-erected at Sydenham and opened, 1854, burned down, 1936, 1-217, fireworks 3-367

Crystals, 3-4; metal in alloys, 1 111; minerals, 5 213 illus., snow, 7-77 illus

Ctesiphon (Tadmor). Anc. city of Babylonia, on Tigris, 4 1 m N.E. of Babylon, cap. of Parthian kingdom, battle between Brit. and Turks (1915), 6 131

Cuba. Independent island republic of W. Indies, area 46,736 sq. mi. pop. 5,308,251 (cap. Havana) 3 6, cane sugar production 7 181

Cubic equation, in algebra, 1-106

Cubic measure. See **Weights and Measures (table)**

CULBIN SANDS

Cubit, an old unit of length, 7-435

Cuchulainn (kooohlin) Legendary Irish hero, 4-287

Cuckoo. Bird, 3-7, 6 205 illus., egg 1-452 illus., mating habits, 1-457 migration 6-204 illus.

Cuckoo-pint. See **Wild Arum** and **Wake-Robin.**

Cucumber, 3 8

Cucurbitaceae. Plant family including cucumbers 3-9, marrow 5 136 melon 5 167

Cuenca (kwenka) Third city of Ecuador in S.W. pop. 41,000 mfg. and trade centre

Cul, César Antonovich (1831, 1918) Russ. composer, produced operas, songs and chamber music 5 306

Cullin Hills (Isl. of Skye) Skye Mts. (4,309 ft.) 4 275

Culrass See **Broadplate.**

Culbin sands. Morayshire, Scot. 10 m. long, 1 m. wide. One of richest areas of Scot. until 11th cent. then storms

RECORDS IN FIRST-CLASS CRICKET

Highest Individual Scores

Australia D. G. Bradman 452 not out for New South Wales (Queensland) 1929-30

England A. C. MacLaren 424 for Lancashire v Somerset 1895

Century in Each Innings

W. R. Hammond (Glos.) scored two hundreds in a match on seven occasions. I. B. Hobbs (Surrey) on six. C. B. Fry (Sussex and Hants) on five. In 1934 A. E. Elgar scored a double century in both innings for Kent v Essex.

Centuries in One Season

D. Compton (Middlex.) in 1947 scored 18 separate hundreds. I. B. Hobbs 16 in 1925. W. R. Hammond 15 in 1934. H. Sutcliffe (Yorks.) 14 in 1932.

Highest Partnership

First wicket. H. Sutcliffe and P. Holmes 555 for Yorkshire v Essex 1932.

First wicket. A. J. Kippax and I. P. H. Hooker 307 for New South Wales v Victoria 1928-29. In England S. Bancroft and C. E. Sewart 213 for India v Surrey 1941.

Highest Individual Aggregate for Season

D. Compton 1,816 in 1947. W. J. Edrich (Middlex.) 1,339 in 1947.

Most Individual Centuries

I. B. Hobbs 19. F. Hendren (Middlex.) 170. W. R. Hammond 167. C. P. Mead (Hants) 133.

Four Wickets with Consecutive Balls

Twenty-three bowlers have taken four wickets with consecutive balls in first class cricket. R. T. Crisp did so twice.

Two Hat Tricks in Innings

A. J. Trott in his benefit match Middlesex v Somerset at Lords in 1907 took four wickets with four balls and also three with three balls.

Two Hat Tricks in Match

A. Shaw for Notts v Gloucestershire in 1884. F. J. Matthews for Australia v South Africa 1912. C. W. I. Parker for Gloucestershire v Middlesex in 1924 and R. Jenkins for Worcestershire v Surrey 1941.

200 Wickets in a Season

200 wickets in a season have been taken 57 times. J. S. 27 different bowlers. A. P. Freeman (Kent) 804 wickets in 1928 holds the record.

2,000 Runs and 200 Wickets

Only G. H. Hirst (Yorks.) has performed this feat in 1906.

3,000 Runs and 100 Wickets

In 1937 J. H. Parks (Sussex) scored 3,003 runs and took 101 wickets.

1,000 Runs and 100 Wickets

W. Rhodes (Yorks.) scored 1,000 runs and took 100 wickets in a season 16 times. G. H. Hirst completed 14 doubles eleven in succession.

200 Wickets and 1,000 Runs

A. E. Trott (twice), A. Kennedy (Hants) (once) and M. W. Tate (Sussex) (three times) are the only players to accomplish this feat.

1,000 Runs in May

W. G. Grace (Glos.) (1895), W. R. Hammond (1927), C. H. Lloyd (Lancs.) (1928), D. G. Bradman (1930 and 1934) and W. J. Edrich (1938) each scored 1,000 runs by May 31.

Innings Aggregate

The 1,107 runs scored by Victoria v New South Wales in 1926-27 is the greatest number of runs ever scored in one innings. Victoria's next innings totalled 36.

Yorkshire's 587 against Warwickshire in 1936 is the highest county innings.

Most runs in a day were scored by Australia against Essex in 1948-721.

Wicket-keeping

I. Ames (Kent) in 1921 caught 79 in 14 stump 148-127 victims.

COUNTY CHAMPIONSHIP

Up to the end of the 1936 season Yorkshire had won the County Championship 23 times (once jointly). Surrey 16 times (twice jointly). Nottinghamshire 12 times (4 times jointly). Lancashire 12 times (4 times jointly).

TEST CRICKET

Highest Innings

England 903 for 7 wickets v Australia at the Oval (1949). Australia v England 729 for 6 at Leeds (1960).

Lowest Innings

South Africa 30, v England at Port Elizabeth (1905-06) and v England at Birmingham (1921).

Record Partnerships

First wicket 350 by I. Hutton and C. Washbrook for England v South Africa at Johannesburg 1948. Last wicket 130 by R. F. Foster and W. Rhodes for England v Australia at Sydney in 1903-04. Highest partnership for any wicket 451 by W. H. Pinfold and D. G. Bradman (2nd wicket) for Australia v England (Oval) 1934.

Record Individual Scores

361 by I. Hutton (England) v Australia at the Oval (1938). 36 not out by W. R. Hammond (England) v New Zealand at Auckland (1923-33). 34 by D. G. Bradman (Australia) v England at Leeds (1930).

Most Individual Centuries

D. G. Bradman 24. W. R. Hammond 22. I. Hutton 19.

Two Centuries in a Match

H. Sutcliffe (twice), D. Compton, W. R. Hammond, I. Pinner, A. C. Horsell for England. W. Birdseye, A. Morris, D. G. Bradman for Australia. G. H. Hirst for West Indies. A. McMillin, B. Mitchell, for South Africa. V. Hazare, for India.

Greatest Number of Wickets in one Match

For England J. Laker took 19 Australian wickets (Manchester 1936). W. Rhodes took 15 Australian wickets (Melbourne 1901-04). H. Ventry took 15 Australian wickets (Lords 1934). S. F. Barnes took 17 S. African wickets (Johannesburg 1913). For Australia I. R. Spofforth took 14 England wickets (Oval 1882).

Highest total of wickets in season 4, 8 Barnes 49 England v S. Africa, 1913-14 (four matches only). Highest against Australia J. Laker, England, 46 in 1956.

Highest aggregate of wickets in all test matches A. V. Bredier, England, 235 (up to end of 1955 season). 103 of them v Australia. For Australia, C. Grimmett, 216.

Hat Tricks

W. Bates, J. Briggs, J. T. Hearne, M. J. C. Allom, T. W. Goddard for England. F. R. Spofforth, H. Trumble (twice), T. J. Matthews (twice in same match) for Australia.

throw sand ashore and blew down trees. Only stretch of desert in Brit. Isles, 5-261.

Culex. Genus of two-winged flies; gnats, 5-271 with illus.

Cullinan diamond, 3-85, 82 illus.

Cullo's Moor. Famous Scottish battlefield in Inverness-shire near Moray Firth; battle (1746), 4-275, 335.

Culter Fell. Mt. in Lanarkshire, Scot., 2,454 ft., 4-444.

Cultured pearls, 6-102.

Culverin. Cannon used in 16th cent. with handles in the form of snakes; was 12 ft. long, weighed 50 cwt. and fired an 18 lb. ball.

Cumae (Kûmê). Anc. city on coast of Campania, w. Italy; oldest Gk. colony in Italy; supposed home of Cumaean Sibyl.

Cumaean Sibyl. Prophetess who offered nine books of prophecies to the Roman King Tarquin the Proud, who refused to pay the price demanded, but after she had destroyed six his curiosity prompted him to buy the remaining three at the price asked for the whole nine.

Cumberland, Ernest Augustus, Duke of (1771-1851). Younger brother of William IV and uncle of Queen Victoria; succeeded to throne of Hanover (1837), 4-128.

Cumberland, William Augustus, Duke of (1721-85). Third son of George II of Gr. Brit.; commanded at Culloden Moor.

Cumberland. Co. of n.w. Eng., pop. 285,347; area 1,520 sq. m.; co. tn. Carlisle, 3-9; graphite deposits, 6-113.

Cumbræ, Great. One of the seven islands of Buteshire, Scot., 2-131.

Cumbræ, Little. One of the seven islands of Buteshire, Scot., 2-131.

Cumbrian mts. Range in n.w. Eng., separated from Pennines by valleys of the Ull and Eden, 3-248.

Cum-div. See **Stock Exchange Terms**.

Cum'in. Spice from a plant of the parsley family.

Cumulative shares. See **Stock Exchange Terms**.

Cumulet. Variety of pigeon, 6-198.

Cumulo-nimbus, clouds, 2-423.

Cumulus, clouds, 2-421, 422 illus, 423.

Cunard Sir Samuel (1787-1865). Brit. shipowner, b. Nova Scotia; founder of Cunard Steamship line.

Cunard-White Star Line. Brit. line of ocean steamers, with headquarters at Liverpool; owns the *Queen Elizabeth*, *Queen Mary*, *Caronia*, *Mauritania*, and other great liners—first regular Atlantic service, 7-29.

Cunaxa. Plains in Iraq, on Euphrates 60 m. n. of Babylon; defeat and death of Cyrus the Younger in battle against his brother Artaxerxes Mnemon 401 B.C.

Cunotator ("The delayer"). Nickname of Quintus Fabius Maximus, Rom. general, 4-127.

Cundall, Charles (b. 1890). Brit. painter; official 2nd World War artist; evacuation of Dunkirk, 3-136 illus. f.

Cuneiform writing. Anc. wedge-shaped script used by Babylonians, Assyrians and Persians, 4-336 1-119 with illus. 5-176, 6-129.

Cunningham, Allan (1784-1843). Scot. poet, 6-514.

Cunningham, Admiral of the Fleet Viscount Andrew (b. 1883). Brit. sailor; c.-in-c. Mediterranean 1939-42; c.-in-c. Allied Naval Forces, Medit.; Admiral of the Fleet in 1948.

Cunningham, Admiral Sir John H. D. (b. 1855). Brit. sailor; in 1943 c.-in-c. the Levant, promoted admiral, and c.-in-c. Mediterranean retiring 1946; succeeded Visct. Cunningham as 1st Sea Lord.

Cunningham-Graham, Robert Bontine (1852-1930). Scot. author and politician. M.P. 1886-92; writings on S. America, where he was soldier and rancher; helped found Scot. Nat. party 1928.

Cunobelin. Brit. king; father of Caractacus, 2-73.

Cupar. Co. tn. Fifeshire, Scot.; pop. 5,530, 3-350.

Cup final. Football Association. Held annually since 1871, except 1915-19, 1939-45. Amateur Football Association cup final held since 1893, except 1939-45.

Cup coral. Species of coral, 5-128 illus. f.

Cupid and Psyche. Story in classical myth., 3-11.

Cuprammonium process, in rayon mfr., 6-369.

Cupro-nickel. Alloy of nickel and copper, used since 1947 in Brit. coinage, 1-115, 5-223.

Curaçao (kooraluh'ô). Isl. in Netherlands Antilles; area 210 sq. m.; pop. 75,587; exports salt, phosphato; peculiar variety of oranges used in Dutch liqueur curaçao, 5-524. For overseas territory formerly called Curaçao see Netherlands Antilles.

Curare. S. American arrow poison; used as anaesthetic, 1-143.

Curd, in cheese-making, 2-314.

Curfew, rung at Oxford, 1-426.

Curia Regia (kûria rê'jia) (Latin "King's court"). Instituted by William the Conqueror as the supreme central judicial body of Eng.; ceased to function in 1268; Henry II's reform of Eng. law system, 4-162.

Curia Romana. Collective body of admin. organizations which aid the Pope in governing I.C. Church, 6-61.

Curie, Eve (b. 1904). Daughter of Marie and Pierre Curie; author and lecturer, 3-12.

Curie, Marie (1867-1934). Fr. physicist, born in Poland, 3-11; discovered radium, 6-351, 352.

Curie, Pierre (1859-1906). Fr. physicist; husband of Marie Curie, 3-11.

Curing, bacon and ham, 1-341.

Curium (Cm). Chem. element; atomic no. 96; atomic weight 242; 3-224.

Curlew. Seashore and moorland bird, native to Europe, 1-456, 7-108 with illus.; migration, 5-204 illus. f.; protective coloration, 6-207 illus. f.

Curling. Game played on ice, 3-12.

Curragh, The. Extensive plain in Kildare, Irish Rep., with racecourse and military training centre.

Curran, John Philpot (1750-1817). Irish lawyer, patriot, and orator; defended Wolfe Tone and other Irish rebels of 1798; bitterly opposed union with Gr. Brit.

Currants. Dried fruit of the currant grape, 3-12, not to be confused with garden currants, of the gooseberry (*Ribes*) family.

Currency. See **Foreign Exchange**. Money.

Current (electric). The passage of current through a body by virtue of a drift of negatively-charged electrons through it, 1-298. For practical purposes current is measured in amperes; and transformer, 7-307; trams and trolley-buses, 7-305.

Currents, of ocean; types of, 5-498.

Currie. A two-wheel chaise drawn by a pair of horses abreast.

Currie, Sir Donald (1825-1909). Scot. shipowner and politician; founder of the Castle Line which merged with the Union Line in 1900 to form the Union-Castle Steamship Co.

Currier (kû'rier). One who dresses and colours leather after tanning.

Curse, and magic, 5-78.

Curtsia (kûrt'sia). Blunted sword carried at Eng. sovereign's coronation as emblem of mercy.

Curtin, John (1885-1915). Australian statesman; leader of Federal Labour party, 1935; prime min. 1941-45.

Curtis-Bennett, Sir Henry Honeywood (1879-1936). Brit. lawyer, outstanding as defending counsel in leading murder trials of the 1920s.

Curtis Report (1945), on the adoption of children, 2-353.

Curtiss, Glenn Hammond (1878-1930). Amer. inventor and pioneer aviator; designer of many aeroplane and flying boat types; inventor of seaplane.

Curtius (kûrt'ius), Ernst (1814-96). Ger. archaeologist, scholar, and historian (*History of Greece*).

Curtius, Marcus (kûrt'shius). Legendary Roman hero; an earthquake chasm in the Forum which soothsayers said would not close until it had received Rome's greatest treasure, was closed when Curtius, declaring that Rome had no greater treasure than a brave citizen, rode his horse into it.

Curule chair (kûr'il). An ivory chair, in shape like a modern camp-stool, used by Roman magistrates.

Curzola. Isl. of Yugoslavia in Adriatic off coast of Dalmatia; 107 sq. m.; pop. 28,000; boat-building, fishing.

Curzon of Kedleston, George Nathaniel Curzon, Marquess (1859-1925). Brit. Cons. statesman; viceroy of India, 1899-1905; sec. of state for foreign affairs, 1919-21; leader of House of Lords, 1916-25.

Cuscus. Genus of the Phalangeres; size of a domestic cat; they feed on leaves, fruit, small birds, and mammals, 5-137.

Cushing, Harvey (1869-1939). Amer. surgeon; pub. several treatises on surgery of the brain; described function of pituitary gland, 5-165.

Cusp. In architecture, a spear-shaped ornament with sharp, rigid point.

Custard apple. A tropical fruit, native of the West Indies, but also cultivated in India and the neighbouring countries; it is dark brown in colour, and netted all over, 3-179.

Custom House. Public building in E. London where the duties on goods entering the Port of London have to be paid; present building erected in 1814 but the Custom House as an institution dates from 1385.

Customs and Excise, 3-12; duties, 4-52; on spirits, 7-137; indirect taxation, 7-231.

Custoza (koostof'sah). It. vil. 11 m. s.w. of Verona; Italians defeated by Austrians in 1848; also in 1866.

Cutch. State of Rep. of India; area 8,461 sq. m.; pop. 567,825; cap. Bhub, 4-241.

Cut glass, in England, 4-30.

Cuthbert, St. (c. 635-687). Eng. bishop, hermit, and missionary; life by Bede; festival March 20; and Lindisfarne, 5-461.

Cut nails. Variety of nails, 5-313.

Cutner, Solomon (pianist). See **Solomon**.

Cuttack. Cap. of Orissa state, Rep. of India, 4-241.

Cutter. Vessel with one mast, having fore and aft sails; the spars are a mast, boom, gaff, and bowsprit, usually small, but sometimes as large as 460 tons.

Cuttings, of garden plants, 3-504.

Cuttlefish, Squid, and Octopus. Sea creatures of class Cephalopoda, 3-12; 1-157 illus.; egg, 3-171 diag.; sepioid, 4-262; movement by water jet propulsion, 4-370.

Cutty Sark. Famous clipper-ship, built on the Clyde, 1869, and formerly engaged in the China tea trade. In 1952 the Cutty Sark Preservation Society was formed to take over the *Cutty Sark* from the Thames Nautical Training Coll., and establish the ship as a memorial to the Merchant Navy. 5-170 illus., 7-38 illus.

Cuvier, Georges, Baron (1769-1832). Fr. naturalist, 3-14, foundation of comparative morphology, 7-526.

Cuxhaven. Spt. of W. Ger. in the Land of Lower Saxony, at mouth of r. Elbe on the North Sea; Centre of Ger. fishing industry. Pop. 48,700.

Cuyper, Albert (1620-91). Dutch painter, 5-384.

Cuzco. Tn. in Peru; pop. 55,631. Industries incl. brewing, tanning cotton, sugar; former cap. of Incu empire; 6-138, 141 illus.

Cyanamide (sian'aid). Radical containing carbon and nitrogen in the ratio of one to two.

Cyanide process. For extracting gold (solution of cyanide of potassium), 4-40, 39 illus.

CYANOGEN

Cyanogen (sian'ojen). A poisonous gas with pungent odour, much used in organic synthesis.

Cyaxares (saks'aréz). King of Media about 624-584 B.C.; founder of Median empire; destroyed Nineveh 606 B.C.

Cybele (sib'elē). The "Great Mother of the Gods". Asiatic goddess identified by Romans with Rhea, mother of Jupiter; her worship became one of the three great cults under Rom. Empire.

Cycads, as descendants of "cone" plants, 3-395.

Cyclades (sik'ládéz). Archipelago in Aegean Sea, forming a dept. of Greece. Approx. 220 in number; area 1,022 sq. m.; pop. 129,000.

Cyclamen (sik'lámen). Plants of primrose family, native to mts. of central Europe, popular as pot-plants in Eng.; kidney-shaped leaves, white, rose or purple flowers with reflexed petals.

Cycle (elektrik). In an alternating electric current there are both reversal and rise and fall of the current and voltage values. One complete series of these events is termed a cycle and may occur many times per second. In Great Britain alternating current is usually supplied to consumers at 50 cycles per second, 6-310.

Cycles and Cycling, 3-14; road safety, 6-109 valve in, 7-376. See also **Cycling Records** (table below).

BRITISH CYCLING RECORDS (AMATEUR)

1 mile (standing start unpaced)	2 m. 12 s.
	E. V. Mills, 1937.
1 mile (standing start paced)	1 m. 47.6 s.
	F. W. Southall, 1931.
1 mile (flying start, unpaced)	1 m. 59.8 s.
	F. W. Southall, 1927.
10 miles (paced)	18 m. 12.5 s.
	F. W. Southall, 1929.
25 miles (paced)	47 m. 15 s.
	F. W. Southall, 1929.
50 miles (paced)	1 hr. 36 m. 42.2 s.
	D. J. Fleming, 1953.
1 hour (motor paced)	41 miles 1,634 yds.
	H. Oxley, 1938.
1 hour (human paced)	31 miles 1,457 yds.
	F. W. Southall, 1929.
1 hour (unpaced)	26 miles 1,020 yds.
	C. G. Marriner, 1947.

Cyclists' Touring Club, 3-16.

Cyclolith (siklólith). Circle of stones such as is seen at Stonehenge in Wiltshire; popularly, but probably erroneously, regarded as Druidic.

Cyclone, 3-16, 7-160.

Cyclopropane, Inhalation anaesthetic; use in 2nd World War, 1-143.

Cyclops. A race of one-eyed giants in Gk. myth, 3-16, 7-370; Odysseus and, 5-501.

Cyclorama (siklorah'mal). Wall or stiff sheet at back and sides of stage on to which lighting and scenic effects are projected.

Cyclostomes. Group of aquatic animals including the lamprey, 4-111.

Cyclotron. Apparatus used in atomic research for accelerating electrified particles, 3-17.

Cyclura. Genus of W. Indian ground iguanas; habits, 4-235.

Cygnets, young swan, 1-161 illus.

Cylinder. Of diesel engine, 3-89; of internal-combustion engine, 4-273 illus. of steam engine, 7-152, 153, 154.

Cylinder. In maths.; volume of, 5-170.

Cymbals. Pair of plate-like metal musical instruments played by clashing together, 5-307.

Cymbeline (sim'belen) (d. c. A.D. 13). Anc. Brit. king whose half-mythical history is used by Shakespeare as a basis for his drama *Cymbeline*.

Cymothoidae (simóthóidē). Family of parasite crustaceans order *Iso-poda*, with hooked legs to enable them to cling to the tails of fish.

Cynicht. Mt. in Snowdonia, Wales; height 2,265 ft., 7-78.

Cynics (sin'iks). School of anc. philosophers, forerunners of the Stoics; their aim was to encourage virtue and simplicity of manner; Diogenes and, 3-91.

Cynthia. Classical name for the moon, 5-259.

Cypress. Coniferous tree yielding durable timber, 3-20, 2-181.

Cyprian (sip'rian), St. (c. 200-258). A leader of African Church, converted to Christianity in middle life; became Bishop of Carthage; beheaded by Emperor Valerian; Festival, Sept. 16.

Cyprus. Brit. Isl. colony in Mediterranean; area 3,581 sq. m.; pop. 450,114; 3-20; copper mines, 2-502, 503; Crusaders' kingdom, 3-2.

Cypselidae (sip'selidē). The swift family of birds.

DAGON

Cyrano de Bergerac (sə'rahnd də burzhārak) (1620-55). Fr. soldier, writer, and dramatist, celebrated for large nose. Subject of play (1897) by Edmond Rostand.

Cyrenaica. Eastern part of Libya, 4-489; Greek colonies, 1-53; and 2nd World War, 7-189, 190 illus.

Cyrenaic school of philosophy, founded by disciple of Socrates.

Cyrene. Gk. city founded 7th cent. B.C. on N.E. coast of Libya. Gave its name to dist. of Cyrenaica, 4-489.

Cyril, St. (c. A.D. 376-114). Bishop of Alexandria noted for zeal against heretics; said to have instigated murder of Hypatia.

Cyril, St. (A.D. 827-69). "The Apostle of the Slavs," to whom is attributed Cyrillic alphabet, 1-120, 1-110.

Cyrus the Great (c. 600-529 B.C.). Founder of the Persian Empire, 6-129; and Jews, 4-375; fall of Babylon, 1-336; overthrow of Astyages, 5-160.

Cyrus the Younger (d. 401 B.C.). King of Persia.

Cythera (sith'erē'a). Name given to the goddess Aphrodite from her island of Cythera.

Cytology. Study of living cells, 2-287, 2-25.

Cytoplasm. Protoplasm surrounding the nucleus of a cell, 6-298.

Czarniecki (charnyets'ki), Stephen (1599-1665). Polish general; drove Swedes under Charles X from Poland, and restored kingdom to King John Casimir (1655-57).

Czechoslovakia. State of cent. Europe; area 19,381 sq. m.; pop. 12,109,000; cap. Prague, 3-21, 7-183; Germany and Sudetenland, 3-318, 4-10; Benes, 1-128, 7-186; Masaryk, 5-143; and 2nd World War, 7-186; flag, 3-384 illus. f.; costume, 2-351 illus.

Czechs (Bohemians). Slavic race-group, 7-66.




Czenstochowa (chenstōhōfa). Polish holy city, 6.5 m. N.W. of Cracow; pop. 120,000.

Czernia (chér'ni), Ottokar, Count (1872-1932). Austro-Hungarian statesman; at outbreak of 1st World War tried to win over Rumania to Central Powers; as foreign min., (1916-18) sought to save Austria-Hungary.

Czernowitz. See **Cernautil**.

Czerny (tsér'ni), Karl (1791-1857). Austrian pianist and composer; teacher of Liszt and Thalberg; exercises for pianoforte still widely used.

D

IN Egyptian picture-writing the symbol corresponding to our letter D was a hand . When conventionalised, it looked like this , and later, among the Phoenicians, became a triangle with a short tail , the tail in time being dropped. The Phoenicians called it *dalth*, which means "door" (remember the primitive house was a tent and the door simply a triangular curtain hung in front of the opening). The name and form of

this letter were adopted by the Greeks with slight variation, and thus *dalth* became *delta*: Δ. The delta of a river gets its name from its resemblance to the Greek letter *della*. For a long time its form did not change greatly, but it showed a tendency to turn over so that its apex was turned to the right. When the sides which met at the apex were written at one stroke, it became the D with the rounded back adopted by the Romans and used to-day.

Dab. Marine flatfish common in European waters, except Mediterranean. Length 10 in. Brownish white below. Both eyes on right side of head. Popular food fish.

Dab'chick. Another name for the little grebe; common in Britain.

Dacca. Cap. of East Pakistan, pop. 411,000, 1-429, 6-44.

Dace. A coarse fish, 6-401 with illus.; bait for, 3-383.

Dachau (dakh'ow). Market tn. of Bavaria, 10 m. N.W. of Munich; paper mills; site of Ger. concentration camp, estab. 1933; overrun by U.S. troops, 1945, 7-496.

Dachshund. Breed of dog, 3-101 illus. f.; 3-103. See also **Dogs** (table).

Dacia. Roman prov. now the country of Rumania, 6-470.

Dactyl, in poetry, 6-233.

Da'daism. Movement in art and lit. begun by Tristan Tzara, Hans Arp and others at Zürich, 1916; anarchical, anti-traditionalist and irrational; in part an expression of revolt against condition of the world. It moved to Paris where its irrationalism was taken over into Surrealism and used constructively. Dadaism died out about 1922. Word *da'ta* (Fr. hobby-horse) was a random choice as title.

Daddy-long-legs, or **Crane-fly**, 3-25. A large fly of the family *Tipulidae*, with very long, thin legs and a narrow, pale brown body. Its larva is the

"leather jacket" so destructive to lawns and grasslands.

Daedalus. In Gk. myth., the first man to fly, 3-25, 1-27, 28 illus.

Daffodil, 3-25; bulb, 2-118 with diag.;

In Scilly Isles, 6-508 illus.

"**Daffodils**, The," poem by Wordsworth, 7-477.

Dagenham. Tn. in Essex, on Thames; pop. 111,588; Ford motor works, 2-298, 3-418.

Daghestan (dahgestahn'). Autonomous republic of Soviet Russia; a. 11,470 sq. m.; pop. 930,000; cap., Makhach-Kala on the Caspian.

Dagon. A Philistine god, worshipped at Gaza; had head and hands of a man and body and tail of a fish.

DAQUERRE

Daguerre, Louis Jacques Mandé (1787-1851). Fr. inventor, with J. N. Niepce, of daguerreotype, 6-170 with illus.

Daguerreotype. An early kind of photograph, 6-170.

Dahl, J. C. (1788-1857). Norwegian painter, 5-467.

Dahlia. Tuberosus rooted perennial plant, 2-25.

Dahna, desert, Arabia; white sands, 4-190.

Dahomey [dahó'mí]. Territory of Fr. W. Africa, former Negro kingdom; 44,500 sq. m.; pop. 1,505,000, 70 m. coast; chief city Porto Novo, pop. 31,000; 7-440; women warriors 1-130.

Daiributsu, Great Buddha. Vast bronze statue at Kamakura, Japan, 4-351.

Dail. House of Representatives of the Irish Rep., 4-283, 3-130.

"Daily Express". Brit. newspaper, and Lord Beaverbrook, 1-401.

"Daily Graphic". Brit. newspaper, and "Daily Sketch", 4-397.

"Daily Mail". Brit. newspaper; Northcliffe and, 5-458.

"Daily Mirror". Brit. newspaper; Northcliffe and, 5-458.

"Daily Sketch". Brit. newspaper, and "Daily Graphic", 4-397.

"Daily Telegraph, The". Brit. newspaper founded in 1853; Lord Camrose and, 2-194, 4-397, 5-406.

Daimios. Barons in Jap. feudal system, 4-344.

Daimler, Gottlieb (1831-1900). Ger. inventor, pioneer in development of motor-car engine; first motor-car, 6-413; first motor-cycle, 5-273.

Dainty Maid. Rose, 6-453 illus. f.

Dalton [diren'] or **Dalry**. Port in S. Manchuria, on Kwantung Peninsula, pop. 101,850; outranked only by Shanghai among Chinese ports; exports soya beans and coal; founded by Russia (1899); 5-112.

Dairy Farming, 3-26; breeds of cattle, 2-274; milk production, 5-205.

Daisy. Flower, 3-27, 3-100.

Dakar. Cap and port of Fr. W. Africa, and dist. (60 sq. m.) within Senegal at tip of Cape Verde, pop. 150,000.

Dakota, North and South. Two states of U.S.A.; North Dakota, area 71,000 sq. m.; pop. 619,636; cap. Bismarck; South Dakota, area 77,000 sq. m.; pop. 652,740; cap. Pierre, 3-28.

Dakota. U.S. military and civil transport plane.

Dakotas. Tribe of N. Amer. Indians of Sioux stock; inhabited Mississippi plains; now few in number.

Dal (Swedish *Dal-Elf*). river in S. Sweden. Rises on Norwegian frontier, flows S.E. and N.E. 250 m., forming several lakes and enters Gulf of Bothnia.

Daladier [daladivá], Edouard (b. 1884). Fr. premier, 1933, 1934, 1938-40. For min., May-June 1940, arrested and removed to Ger., 1943; released 1945; and Munich agreement 7-486 illus.

Dalai Lama [dal'í lah'ma]. Chief priest of Lamaism, the religion prevalent in Tibet. He has supremacy in all spiritual matters; 7-273 and illus. f.

Dalbottle. Tn. in Kirkcubrightshire Scot., pop. 3,288, 4-115.

Dalroze, Emilie Jacques. See **Jaques-Dalroze**.

Dale, Sir Henry H. (b. 1875). Brit. physiologist; shared Nobel prize for medicine, 1936; President of Royal Society 1940-45; from 1942 director of Scientific Advisory Cttee. to Brit. war cabinet; Pres. Brit. Ass., 1947.

Dalécarlia [dahlekar'hia] ("the valleys"). Picturesque region in Sweden; iron, copper, silver, lead.

Dalhouisie, George Ramsay, 9th Earl of (1770-1858). One of Wellington's generals in Peninsular War; gov.-gen. of Canada (1820-28).

Dalhousie, James Ramsay, 10th Earl and 1st Marquess of (1812-60). Brit. administrator and empire-builder; gov.-gen. of India (1849-56); an-

nexed Punjab and other native states; established imperial telegraph and postal systems; built first rly., completed Ganges canal.

Dall [dah'l], Salvador (b. 1904). Spanish Surrealist painter; expressing the irrationalism of dreams, he influenced greatly ballet décor, decorative arts, film technique.

Dalkeith. Tn. in Midlothian, Scot.; pop. 8,786, 5-40.

Dallas, Texas, U.S.A., leading mfg. city and rly. centre of state; agric. trade; pop. 434,462, 7-200.

Dalmatia. Coastal territory of Yugoslavia; about 4,900 sq. m., 3-28; chief port and trading centre, Split (Spalato), 7-519, 520 illus.

Dalmatian. Breed of dog, 3-102, 100 illus. f.

Dalmatians. Slavic race-group, 7-66.

Dalry. See **Dalren**.

Dalton, Hugh (b. 1887). Brit. Labour politician, chancellor of exchequer, 1945-47, from which post he resigned after an indiscretion over Budget secrets.

Dalton, John (1766-1844). Brit. chemist and physicist, 3-29; atomic theory, 1-296, 2-317.

Daly, Fred (b. 1911). Irish golfer, winner of open championship (Brit.), 1947; winner of professional tournament 1947, 1948, 1952; 4-44.

Dalziel [dæ'el], Henry James, Baron (1868-1935). Brit. newspaper owner and politician; had interest in *Pall Mall Gazette*, *Daily Chronicle* and *Sunday News*.

Dalziel, George (1815-1902). Brit. engraver, 3-293.

Dam. Barrier built across watercourse to store water, 3-29; beavers, 1-400; (tatin dam, 8-50). Hoover dam, 3-32 illus. f.; hydro-electric installations, 4-217; Lloyd Barrage, 3-30 ding; on riv. Nile, 5-410.

Daman. Portuguese apt., and settlement on W. coast of India at entrance to Gulf of Cambay, 4-240.

Damanhur. Tn. in Lower Egypt, rly. centre; pop. 61,000; textiles; anc. Thmehor (tn. of Horus); known to Greeks as Hermopolis Parva.

Damão (Portuguese India). See **Daman**.

Damar resins, 6-389.

Damascene [damas'en]. Ornamentation of metal by inlaying with other metals.

Damascus. Cap. of Syria; pop. 335,000, 3-34, 7-217; sword blades 5-89.

Damask Cloth, 2-419 with illus.

Dame, in pantomime, 6-40.

Damien, Father (1810-89). Belg. priest and missionary, 3-34.

Damietta [damiet'a]. Port and trade centre in Lower Egypt on delta of Nile; pop. 40,332; anc. city bulwark of Egypt against Crusaders; 3-173, 6-140.

Damocles [damokl'ez]. Gk. courtier at Syracuse, 3-36.

Damon and Pythias, 3-36.

Dampier, William (1652-1715). Eng. navigator, 3-36, 1-317.

Dampier Archipelago. Group of high rocky isls. off N.W. coast of Australia.

Damp-proof course, in building, 2-117.

Damsel-fly. Kind of dragon-fly, 3-112.

Damson. Fruit tree of the genus *Prunus*, 6-228.

Dan. Son of Jacob and Bilhah, ancestor of Hebrew tribe of Dan (Gen. xxx. 6).

Dan. Anc. tn. in N. Palestine, at head of r. Jordan, settled by descendants of Dan; "from Dan to Beersheba," from one end of Palestine to the other.

Danby, Thomas Osborne, Earl of (1828-1712). Political adviser of Chas II, later Duke of Leeds, 3-379.

Dana, Richard Henry, Jr. (1815-82). Amer. jurist and author (*Two Years Before the Mast*, classic sea story, describing voyage to California as ordinary seaman).

Danaë. In Gk. myth., mother of Perseus, 6-128.

Danaides [daná'idéz]. In Gk. myth., the 50 daughters of Danaüs, king of Libya, doomed to fill sieves with water throughout eternity for killing

DARIEN SCHEME

their husbands at their father's command.

Dancing, 3-37; basic steps, 3-38; Congo war dance, 1-58 illus.; folk dances, 3-406, 407 illus.; Hawaiian girl dancers, 4-139 illus.; magic dance of aborigines, 5-33 illus. f.; Red Indian, 6-374; ritual dance of Vatusi, 1-59 illus.; Spanish, 7-110 illus.

Dandelion. Flowering weed of *Compositae* family, 3-40; pollen grains, 3-399 illus.; seeds, 6-528.

Dandie Dinmont. In Scott's *Guy Mannering*, a rough, shrewd, humorous Scotch farmer from whose dogs are named the "Dandie Dinmont" breed of Scots terriers.

Dandie Dinmont terrier. Dog, 3-100 illus. f. See also **Dogs** (table).

Dandolo [dandó'ló], Enrico (c. 1120-1205). Doge of Venice, 1193-1205; leader of Crusaders in capture of Constantinople during 4th Crusade.

Dandy horse. See **Pedestrian curriole**.

Danegeld [dān'gold]. A tax levied in Eng., 10th to 12th cents.; originated as tribute to Danes.

Danelaw. Territory in E. Eng. ruled by Danes in 9th and 10th cents.

Danes (Northmen); Alfred the Great and, 1-103; in Eng., 3-276; and Brit. cattle, 2-273.

Daniel. Hebrew prophet and hero of the Book of Daniel, O.T., 3-40, 6-296, 1-359.

Danish Blue, type of soft cheese, 2-315.

Danish hebeado work, type of embroidery, 3-239.

Danish language, and English vocabulary, 3-282.

Dan'necker, Johann Heinrich von (1758-1841). Ger. sculptor, friend of Schiller; his work a constant struggle between classic and naturalistic schools.

D'Annunzio, G. See **Annunzio**.

Dante Alighieri (1265-1321). (Greatest It. poet, 3-45, 4-239; in Renaissance, 6-384; tomb at Ravenna, 6-388.

Danton, Georges Jacques (1759-91). Fr. Rev. leader, 3-47; and Committee of Public Safety, 3-169; guillotined by Robespierre, 6-415.

Danube. Second longest r. of Europe, 1,780 m. from S.W. Ger. to Black Sea, 3-47, 6-470, 3-308, 4-205, 6-226, 7-517.

Danube Canal. Branch of r. Danube, flows through centre of Vienna, 7-397.

Danzig, or **Gdansk**, Poland; pop. 169,875, 3-48, 6-210, 4-4, 6-238, 7-403.

Daphne. A nymph in Gk. myth. turned into laurel tree, 3-49.

Daphne Laureola. Latin name of the "pungo laurel", 4-456.

Dapsang (mt.). See **Godwin-Austen**.

Darby, Abraham (1677-1717). Eng. ironmaster; his sons, both Abraham (1711-63; 1750-91), succeeded him at the famous Coalbrookdale works; and coke-smelting, 2-447, 4-260.

Darby, Abraham (1750-1791). Eng. ironmaster, son of preceding; and Coalbrookdale bridge, 2-60.

Darby and Joan. John Darby (d. 1740) and his wife Joan, originals of hero and heroine of Henry Woodfall's ballad "Darby and Joan" or The Happy Old Couple," illustrating married happiness.

Dardanelles (anc. Hellespont). Narrow strait separating Europe from Asia, 3-49, 7-480, 479 illus.

Dar el Baida. See **Casablanca**.

Dar-es-Salaam [dahrossalahán]. Spt. cap. of Tanganyika Territory, E. Africa; pop. 99,140; 7-221 illus.

Darfur. Westernmost division of Anglo-Egyptian Sudan. Area 153,000 sq. m., pop. est. 1,000,000.

Darien [dā'rien], Isthmus of. Another name of Isthmus of Panama; sometimes applied only to lower portion.

Darien Scheme. Unsuccessful attempt to establish Scottish colony on Isthmus of Panama (Darien), headed by William Paterson; settlement begun in 1698; Sp. opposition, starvation, and disease led to abandonment in 1700.

DARIUS

Darius [dar'us], *J., the Great* (c. 558-485 B.C.). King of Persia; war with Greece, 490-480; and Daniel, 2-45, 6-236; coins, 5-235; rock inscriptions, 6-130 illus.

Darius III (c. 380-330 B.C.). Last king (336-330 B.C.) of Persian Empire, conquered by Alexander the Great, 1-98, 6-131 with illus.

Darjeeling. Tn. of W. Bengal, Indian Repub.; pop. 25,000; tea plantations, 1-429; 4-244 illus.

Dark Ages, *The*. Name given to the earlier part of the Middle Ages; in Britain, 4-180.

Dark Green Fritillary, butterfly, 2-140 illus.

Dark-ground illumination, in microscopy, 6-196.

Darian, **Admiral Jean** (1881-1942). French gov. N. Africa; resisted Allied invasion Nov. 1942, capitulated and joined Fighting French; assassinated Dec. 1942; in Britain and, 6-144.

Darling, **Grace Horsley** (1815-12). Brit. heroine, 3-48.

Darling, R. of Australia, rises in Australian Alps, flows s.w. through New South Wales to join Murray r., 1-316, 5-402.

Darling Downs, Australia; sheep rearing, 6-324.

Darling Range. Low mts. in W. Australia, running parallel with coast for nearly 250 m.

Darlington. Industrial tn. of Durham, on r. Skerne, 18 m. s. of Durham city; large rly., iron, engineering works; the rly. to Stockton was the first passenger line to use steam locomotives; pop. 84,811; 3-139.

Darmstadt [darm'shtât]. Ger. mfg. and rly. centre in the *Land of Hesse*, 20 m. s. of Frankfurt.

Darling, 7-7.

Darnley, **Henry Stuart, Earl of** (1515-67). Scottish noble, 2nd husband of Mary Queen of Scots; murder of Rizzio, 5-112.

Dart, **Raymond Arthur** (b. 1893). Brit. anatomist; and "missing link," 5-105.

Dart, R. of Devonshire, flows to Eng. Channel; 46 m. long.

Dartford. Tn. of Kent, Eng., 17 m. from London; pop. 40,510.

Dartford College of Physical Education, founded by Mme. Bergman, 6-181.

Dartford Warbler, a song-bird, 7-419.

Dartmoor. Rugged tableland in s.w. Devon, Eng.; about 20 sq. m.; convict prison at Princetown, 3-82; 4-148 illus. f.; 3-247.

Dartmoor sheep, 7-22.

Dartmouth. Spt. in Devon, Eng., near mouth of r. Dart; pop. 5,842; castle; shipbuilding and engineering industries; here Crusaders embarked for Holy Land (1190); Royal Naval College, 5-335.

Darts. Game, 3-50.

Darwen. Industrial tn. of Lancs, Eng., 3 m. s. of Blackburn; cotton and paper mills; pop. 30,820.

Darwin, **Sir Charles Galton** (b. 1887). Brit. physicist; grandson of Charles Darwin; director of National Physical Lab. from 1938; chief of the Brit. cttee. of scientists advising on the atomic bomb.

Darwin, **Charles Robert** (1809-82). Brit. biologist, 3-51; theory of evolution, 3-323; and natural selection, 1-155; Huxley and, 4-212; and Galapagos Isl., 3-498; as a comparative anatomist, 1-143.

Darwin, **Erasmus** (1731-1802). Brit. physician, naturalist, and poet, grandfather of Charles Darwin.

Darwin, **Sir Francis** (1846-1925). Brit. botanist, 3rd son of Charles Darwin, whose biography he wrote.

Darwin, **Sir George Howard** (1845-1912). Brit. geologist and astronomer, 2nd son of Charles Darwin; made estimate of earth's age; study of the moon, 6-257.

Darwin, Australia. Spt. and chief tn. of Northern Territory on n.w. coast; international airport.

Dasylus aruanus. Tropical fish, 6-128 illus. f.

Dash, in punctuation, 6-309.

Dashboard, of motor vehicle; instruments on, 5-282.

Das Kapital, by Karl Marx, 5-139.

Dates. Fruit of date palm, 3-53; date palm, 6-50 illus.

Daubigny [dôbên'yê], **Charles François** (1817-78). Fr. landscape painter and etcher of Barbizon school, 3-440.

Daudet, **Alphonse** (1840-97). French novelist and essayist, 3-53.

Daugavpils or **Dvinsk**. City of s.e. Latvia; pop. 45,000. former Rus fortress; linen, flax, sawmills.

Dauver, **Eustache**, supposed Man in the Iron Mask, 4-296.

Daumier [dômyâ], **Honoré** (1808-79). Fr. caricaturist and painter, inspired by inexhaustible genius for mockery of social and political life; drew about 4,000 lithographs; as a painter was a pioneer of naturalism.

Dauphin (Fr. "dolphin"). Title borne first by rulers of certain Fr. territories, called the Dauphiné; when the Dauphiné became crown land (1364), borne by every Fr. king's eldest son; Charles VII, 4-376.

Dauphin, Lake. Manitoba, Canada, 5-114.

Dauphiné Alps. A range of the Alps in former Dauphiné prov. in s.e. Fr. (13,462 ft.).

Davao. Tn. in Philippine Is.; pop. 111,263, 6-156.

Davenant [däv'enant], **Sir William** (1606-68). Eng. poet and dramatist, became poet laureate in 1638, following Ben Jonson, his heroic poem "Gondibert" written while in prison for a political offence; 3-285, 6-232.

Daventry. Tn. in Northants, Eng., pop. 4,078; broadcasting station, 5-156.

David, **St. (d. c. 601)**. Patron saint of Wales, who established several monasteries; his festival day is March 1; keels worn by Welshmen 5-512.

David (c. 1030-990 B.C.). King of Israel, 3-53, 4-371, 1-439; and Philistines, 6-158; conquest of Jerusalem, 4-362; statue by Michelangelo, 5-190, 192 illus.

David I (1084-1153). King of Scotland, 1123-53. Son of Malcolm Canmore and St. Margaret of England; called "maker of Scotland"; reformed courts, established many towns; promoted trade, shipping, and manufactures.

David II (1321-71). King of Scotland. Crowned king in 1331 at death of father, Robert Bruce; began to rule in 1341; weak and incapable.

David [dähd'st], **Filipien César** (1810-76). Fr. composer; spent years in East, and expressed oriental colour in his work; symphonic ode *The Desert* (1844) brought fame, ornatorio *Moses on Sinai*; operas *Herculeanum*, *Lalla Rockh*.

David, **Gerard** (c. 1450-1523). Flemish painter, 5-381.

David, **Jacques Louis** (1748-1825). Fr. portrait and historical painter; active revolutionist, later court painter to Napoleon, 3-439; Mme. Recamier, 3-444 illus.

David Copperfield. Novel by Charles Dickens, 4-399.

Davidson, **John** (18c. 1900). Eng. poet; thoroughly pessimistic, best known for ballads; wrote *Bruce Scaramouch* in *Narros*, fantastic plays; *Fleet Street Eclogues*.

Davidson, **Randall Thomas**, **Baron** (1848-1930). Archbishop of Canterbury, 1903-28.

Davies, **Sir (Henry) Walford** (1869-1941). Brit. musician; Master of the King's Music 1934-41.

Davies, **Rhys** (b. 1903). Welsh novelist, 7-115.

Davies, **William Henry** (1870-1940). Brit. poet; tramp and pedlar in England and America for several years. (*Autobiography of a Super-Tramp*); 3-291, 7-415.

Davis, **Jefferson** (1808-89). Amer. soldier and statesman; president of the Confederate States on outbreak

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of Civil War., proved an inadequate leader in a difficult cause; captured at end of war, he was pardoned in amnesty of 1868, 5-227.

Davis, **John** (c. 1555-1605). Eng. navigator and early Arctic explorer; discovered (1587) Davis Strait, 1-133; early visitor to Easter Island, 3-155.

Davis, **Joe** (b. 1901). Brit. billiards player; won billiards championships 10 times; world snooker champion 16 times, consecutively from 1927, then retired, his snooker break of 116 (1950) was a world record; 7-7.

Davis Breathing Apparatus, method of escape from sunken submarines, 7-177 illus.

Davis Cup. International lawn-tennis team competition, instituted by Dwight Davis in 1900, 4-161.

Davis Mt. (U.S.A.). See **Negro Mt.**

Davis Strait. Between Greenland and Baffin Island; connects Baffin Bay with Atlantic; width 180 to 500 m.

Davits. See **Nautical Terms** (table).

Davitt, **Michael** (1846-1906). Irish politician and Home Ruler; a Fenian, was imprisoned for arms traffic 1870-77; founded Irish Land League (1879); imprisoned again, turned socialist (was first socialist M.P.) and became anti-Burnellite; several times M.P.

Davos [dävos]. Winter resort in Switzerland lying in cañon of Rhodens.

Davout [dä'vut], **Louis Nicolas, Duke of Auerstadt and Prince of Eckmühl** (1770-1823). One of Napoleon's marshals; distinguished himself by brilliant victories at Auerstadt and Eckmühl, turned (like at Wagram), minister of war during "100 days."

Davy, **Edmund** (1785-1857). Brit. chemist; discovery of acetylene, 1-9.

Davy, **Sir Humphry** (1778-1829). Brit. chemist and physicist; inventor of Davy safety-lamp, 3-54; and theory of heat, 4-145; and Faraday, 3-340; separated magnesium, 5-81; and potassium, 6-272, work on anaesthetics, 1-112; and sodium, 7-82.

Davy Jones. Sailors' colloquial name for the devil or bad spirit of the sea; "Davy Jones's Locker," place where men and ships go when lost at sea.

Dawes, **Charles Gates** (1865-1951). Amer. statesman, head of committee that framed the "Dawes Plan" for the payment of German reparations (1923), 7-485; vice-president of U.S.A. (1924); ambassador to Gr. Britain (1929-32).

Dawn-horse. See **Echippus**.

Dawn men. See **Chellean people**.

Dawson City Canada. Former cap. (until 1952) of Yukon Territory and centre of Klondike mining region on Yukon r.; pop. at time of gold rush, 20,000, now 783, 7-520.

Dawson of Penn, **Bertram Edward Dawson**, 1st Viscount (1864-1945). Brit. royal physician to Edward VII, George V, Edward VIII, and George VI; first physician in practice to be made peer (baron, 1920).

Day, **Thomas** (1748-89). Eng. writer, author of *The History of Sandford and Merton* (1783-89), one of the earliest children's books, 2-356.

Day, 3-55; seasons and variation of length, 6-526; time divisions of, 7-279; length of day on planets, 6-212.

Daylight Saving, 3-55, 7-278.

Days of grace. Extension of time allowed for settlement of bills after they become legally due.

Dayton, Ohio, U.S.A. Mfg. city; home of Wright brothers, the airmen; pop. 243,872; 5-506.

Daytona Beach. City, Florida, U.S.A.; winter resort; pop. 30,187; motor racing, 3-393.

D-Day. See **Normandy invasion**.

D.D.T. (Dichloro-diphenyl-trichloroethane), insecticide compounded in 1874, came into use in 2nd World War against typhus-carrying lice and other insects, 3-92, 5-93.

Deacons. In early Christian Church, 2-379.

Dead-eye. See **Nautical Terms** (table).

DEAD-LEAF BUTTERFLY

Dead-leaf butterfly, Indian butterfly; protective coloration, 2-136.
Dead Letter Office, Popular name of the Returned Letter section of the G.P.O. Here undelivered postal packets are collected and either returned to the sender or destroyed.
Deadly Nightshade, Poisonous plant, 5-439, 6-236, 237 illus.; leaves, 4-471 illus.
Dead nettle, Plant belonging to the *Labiatae* family, 5-393.
Dead reckoning, navigation by, 5-338.
Dead Sea, Salt lake in S.E. Palestine, 3-55, 1-261; magnesium, 5-81; salt, 5-196; potassium, 6-272; *Jebel Usdum*, 6-49 illus.
Deadweight tonnage, of ships; how it is reckoned, 7-32.
Deaf, Education of the, 3-56.
Deafness, 3-148.
Deák (dák'), **Francis** (1803-70), Hungarian statesman, one of ablest political leaders in Europe; chief organizer (1867) of Austro-Hungarian dual monarchy.
Deal, Tn. in Kent, Eng.; pop. 21,276; landing by Caesar, 4-308.
Deal, in lumbering, 5-49, 6-203.
Dean, Church dignitary, 2-261, 2-386.
Dean, Forest of, District (25,000 acres) in W. Gloucestershire, between the Severn and Wye; anc. royal forest; 3-248, 4-34.
Dearg, Lough, Two lakes of Irish Rep. One 24 m. long and 1-2 m. wide is a widening of the r. Shannon, 7-16. The other, in co. Donegal, is 25 sq. m. in area.
Death duties, payable by those who benefit under a dead person's will, 7-231.
Death's Head Moth, 2-142 illus.
Death Valley, U.S.A., desert region of S. California, 2-177.
Death-watch beetle, *Nestobium ruficollis*, insect whose larva bores into old oak beams, often doing immense damage, 1-414.
Deauville (dô-vill'), Holiday resort on coast of Normandy, Fr., 5-419.
Debentures, in stocks and shares, 7-159.
Debits, in book-keeping, items shown on the debit side, indicating money owing, 2-11.
Deb'orah, Hebrew heroine, prophetess, and judge, who helped to deliver Israelites from Canaanites, 4-374.
Debrecen (deb'retsen'), Hungary. City 135 m. E. of Budapest; pop. 125,033; centre of Hungarian Protestantism; here Kossuth (1849) proclaimed deposition of Hapsburgs; varied mfrs. and trade, 4-205.
Debrett, last of peerage of the U.K., pub. under the name of an early compiler, John Debrett (c. 1752-1882).
Debt, bankruptcy practice, 1-363.
Debussy, (debü'ssè), **Claude Achille** (1862-1918), Fr. composer, leader of a new school; produced music of elusive and subtle beauty by use of "whole-tone" scale; influence on music, 5-305; opera *Pelléas and Mélisande*, 5-519, 5-515.
Decagram, The 10 gram unit in metric system (0.353 oz.).
Decalitre or centistère, The 10 litre unit of metric system (22 gallons, 0.77 pints).
Decalogue ("ten words"). The Ten Commandments.
Decameron, A famous collection of stories by Giovanni Boccaccio, 4-329.
Decimetre, The 10 metre unit in metric system (10.936 yds.).
Decathlon, In athletics, 1-292.
Decan, The, Plateau in peninsula of India; 4-240, 1-264.
December, 12th month in the year, so called because it was the 10th month of the old Roman calendar, 5-255.
Desemvirs [desem'vers] ("ten men"), Rom. commission appointed 451 B.C. to draw up code of laws, 6-430.
Deception Island, Falkland Is. Dependencies; base for survey work, 1-170.
Decibel, The logarithmic scale for the comparison of sound energies is

graduated in units of "1 bel" subdivided into 10 decibels. An increase of 1 decibel represents an increase in sound of 26 per cent., the smallest change that the average person can detect; the noise of a pneumatic drill 20 ft. away is about 90 decibels. *See Phon.*

Deciduous trees; deciduous forests, 3-121; how leaves fall, 4-472; cork growth in, 2-505.

Decigram, The 1/10th of a gram unit of metric system (1.543 grains).

Decilitre, The 100 cubic centimetre unit of metric system (0.176 pints).

Decimals, 3-57.

Decimetre, The 1/10th of a metre unit of metric system (3.937 in.).

Decius (dê'si-üs) (A.D. c. 201-251), Rom. emperor (249-51), remembered chiefly for Christian persecutions; killed fighting Goths, 4-49.

Deckle, in paper-making, 6-69.

Deckle edge, in paper-making, 6-71.

Deck quoits, a game played on board ship, 6-326.

Declaration of Independence, American (1776), 1-138, 7-361.

Declaration of Indulgence (1672), and Baptists, 2-125.

Declaration of Right (1688), in Eng. hist., 3-280.

Declaration of the Rights of Man, issued by Fr. Assembly (1789), 1-446.

Declination, of a star, the angle made between an imaginary line from the observer to the star and the plane of the earth's Equator, used in pointing telescopes.

Declination or variation, of compass, angle between magnetic north and true north, 5-83.

Decline and Fall of the Roman Empire, by Edward Gibbon, 4-19.

Decorated, Architectural style in England (1307-1377), 1-211.

Deduction, in philosophy, 6-159.

Dee, R. of Wales and Eng.; length 70 m. rises in Arenig mts. and flows through Bala Lake, then N.E. to Chester, 5-175, 2-331.

Dee, R. in Scot., famous for salmon; flows 87 m. to North Sea at Aberdeen, 1-5, 4-404.

Dee, R. in Scot., flows to Kirkcudbright Bay; 4-5 m. long.

Deer, 3-59, 5-333 illus.; horns, 4-194; hunting, 4-209; reindeer, 6-379.

Deerhound, Breed of dog, 3-101 illus. *See Dogs* (table).

Defence Medal, Brit. medal issued to some 7,000,000 persons for military, naval, air force, or civilian service during the Second World War, ribbon flame-coloured edged with green and with two black stripes.

Defender of the Faith, Title borne by all Eng. sovereigns since Henry VIII; origin of title, 4-168.

Defenestration of Prague (1618), and Thirty Years' War, 1-503, 504.

Deferred stock, or bonds. *See Stock Exchange Terms*.

Defiant, Type of Brit. fighter plane in 2nd World War; in Battle of Britain, 2-74.

Deflation, Diminution in volume of currency, causing money units to rise in value and prices of commodities to fall, 5-234.

Defoe, Daniel (c. 1660-1731), Eng. novelist and jour. alist, 3-65, 5-471; 3-287; and original of Robinson Crusoe, 3-2; and press gangs, 6-285.

De Forest, Lee (b. 1873), American electrical and radio engineer. Added third electrode to the thermionic valve, making possible its use as a detector of radio signals. Invented the audion for amplifying telephone signals. Broadcast the voice of Caruso in 1910, and in 1916 set up first broadcasting station in U.S.A.; 6-316.

Degas (dâ'gah), **Hilaire Germain** (1831-1917), Fr. impressionist painter of the ballet, etc., 3-449, 1-352 illus.

Degaussing [dê'gaw-sing], Method of protecting steel ships against magnetic mines; through an insulated cable which encircles the ship high above water-line is run an electric current of strength to neutralise

DELECTABLE MOUNTAINS

the natural magnetic field of the ship, 5-221. Named after K. F. Gauss. *See Gauss*.

Degree, Title of honour or mark of distinction conferred by colleges and univs. on students, such as B.A., bachelor of arts; M.A., master of arts; B.Sc., bachelor of science, 7 frontis., 7-369.

Degree, the 360th part of a circle; of latitude and longitude, 4-152.

Degree (muscle). *See Musical Terms*.

De Havilland, Sir Geoffrey (b. 1882) Brit. aircraft designer. Made first flight 1908 in plane designed by himself; in 1931 awarded first British gold medal for Aeronautics, produced 1942 Mosquito all-wood fighter-bomber, 1945 Vampire jet fighter, 1949 Comet jet airliner.

Dehmel, Richard (1863-1920), Ger. poet, 4-14.

Dehydrated food, food from which the water has been removed, 7-373.

Delanira, In Gk. myth., wife of Hercules; and death of Hercules, 4-166.

Delphobus (dêl'fob-üs), brother of Hector in Gk. myth.

Delra (dê'ra), Anc. kingdom in Eng., united with Bernicia as Northumbria.

Deirdre (dêr'dri), In anc. Celtic myth., a beautiful woman fated to cause misfortune, heroine of most famous of Ulster cycle of old Irish tales, the *Death of the Sons of Uisnech*, one of the *Three Sorrows of Story-Telling*, basis of dramas by "Æ." Yeats, and Synge, 4-287.

Deism, System of belief which admits the existence of a God, but denies the existence or even the necessity of a divine revelation.

Dekkan. *See Deccan*.

Dekker, Thomas (c. 1570-1611), Eng. dramatist and pamphleteer, pictured London life of his time. Plays include *The Shoemaker's Holiday* (1600); prose includes *The Gull's Hornbook* (1609); 3-119.

Delacroix (delahkri-wah), **Eugene** (1798-1863), Fr. painter, great colourist, leader of Romantic school, 3-110.

DeLafayette, **E. M.** (1890-1943), Brit. authoress of light, humorous prose.

The Diary of a Provincial Lady

Real name, Elizabeth M. De-la-wood

Delagoa Bay, Inlet of Indian Ocean in Port. colony of Mozambique, S.E. Africa, 3-65.

De La Mare, Walter (John) (1873-1956) Brit. poet and novelist; *Pancock Pie*; *Henry Brocken*; *On the Edge*; *Memoirs of a Midget*; *The Listeners*, and much excellent children's verse 2-357, 3-291.

Delarey (delahrá), **Jacobus** (1818-1915) Prominent Boer general, who was assistant commandant-general of the Transvaal army in the Boer War (1899-1902); victor of several engagements, in one of which he took Lord Methuen prisoner.

Delarocche (delahrosh'), **Paul** (real name Hippolyte) (1797-1856), Fr. historical and portrait painter; *Laud blessing Strafford*, 4-153 illus.

De Laval, Carl Gustaf Patrik (1845-1913), Swedish inventor of cream separator (1879); first successful steam turbine (1883), and flexible shaft (universal joint).

Delaware, or **De La Warr**, **Thomas West, Baron** (1577-1688), Brit. soldier and administrator; colonial governor of Virginia (1609-18). Delaware state and r. named after him; 3-66.

Delaware, State of U.S.A.; area 2,057 sq. m.; pop. 318,085, 5-66.

Delaware, r. of U.S.A.; 410 m. long 6-119.

Delaware Indians; William Penn and 6-118, 117 illus.

Deloassé (delkash'), **Théophile** (1852-1923), Fr. statesman instrumental in cementing Triple Entente and Fr. alliance with Russia; minister for foreign affairs (1898-1905), and for brief periods between 1911 and 1915; ambassador to Russia (1913).

Delectable Mountains, The, in *Pilgrim's Progress*, 2-127.

DELEDDA

Deledda, Grazia (1873-1936). It. author of over 20 novels, many dealing with her native Sardinia; Nobel prize for lit., 1927.

De Lesseps, Ferdinand. See **Lesseps**.

Delft. Tn. in Netherlands famous for pottery; pop. 64,676; 3-66; 5-372.

Delft. Variety of Dutch pottery; 3-66; 6-277.

Delhi [dél'hi]. Cap. of Indian Rep., and chief city of Delhi state; pop. (city) 322,000; pop. (state) 918,000; area 373 sq. m.; 3-66; 4-241; Durbar, 4-254, 253 illus.; observatory, 4-250 illus.; peacock throne, 6-100.

Delian League, in Gk. history, 4-76; and Aristides, 1-227.

Delibes [dél'ib]. Clément Philibert Léo (1836-91). Fr. composer; ballets *Coppélia*, *Sylvia*.

Delilah. Philistine woman loved by Samson, whose downfall she caused by cutting his hair, 6-195.

Delius, Frederick (1862-1934). Brit. composer of Ger. parentage, 3-68, 6-306.

Della Robbia, Andrea (1435-1523). Florentine sculptor, 4-320; terracotta medallion, 6-385 illus.

Della Robbia, Luca (1399-1482). Uncle of Andrea; marble reliefs, Singing Gallery in Florence cathedral; 4-320.

Delos [dél'os]. Gk. isl. in Aegean; smallest but most famous of Cyclades; birthplace of Apollo.

Delphi. In anc. Greece, shrine and oracle of Apollo, 3-69, 1-184; remains, 4-76 illus.

Delphinium. Flower, carpels, 3-395; sepals and petals, 3-400.

Del Rio, Andres Manuel (c. 1819). Span. mineralogist who in 1861 in Mexico discovered vanadium.

Delta. Tract of land formed by alluvial deposits at river mouth, 6-188; of Nile, 3-173, 174 map.

Delta, δ , Δ (Rom. d. D). Fourth letter of the Gk. alphabet.

Delta metal, an alloy of zinc.

Delta wing. See **Aeronautics** (table).

Deluge, The. Flood which overwhelmed the earth in time of Noah (Gen. vii.).

Demagnetisation, 5-81.

Demavend, Mt. Persia. Extinct volcano, 18,549 ft.

Demerara. River and tn. of British Guiana; gave name to brown sugar, 4-102.

Demarcation, Line of. Imaginary line from North to South Pole some 500 m. w. of Azores; fixed in 1493 by Pope Alexander VI; all lands discovered to E. were to belong to Port. and all w. to Sp.

Demersal fish. Salt-water fish living near the sea bed, 3-379.

Demeter. Gk. goddess of agriculture, the Roman Ceres, 3-69.

Demetrius I (337-282 B.C.). Called "Poliorcetes" ("besieger"); besieged Rhodes with elaborate machinery 305-304 B.C.; established supremacy over Macedonia and Greece, seizing throne 294 B.C.; expelled by Pyrrhus and died a prisoner of Seleucus.

Demetrius [dém'et'rius] or **Dmitri** [dm'itré]. Russian pretender; appeared in 1603, took name of heir to the throne who had been secretly killed by the usurping Tsar Boris Godunov; reigned until his murder (1606).

de Mille, Cecil B. (b. 1881). Pioneer Amer. film director, 2-306.

Democracy, 3-69; in anc. Greece, 4-76, 1-288; in Brit. govt., 4-50.

Democratic Party (U.S.A.), 7-361.

Democritus [démok'ritus] (c. 460-357 B.C.). Gk. philosopher; called "Aristotle of 5th century," also inappropriately styled the "Laughing Philosopher," as Heraclitus was the "Weeping Philosopher"; advanced theory of the mechanical formations of the universe by atoms in action, 1-299; and telescope, 1-280; 6-160.

Demoiselle. See **Damsel**-fly.

Demonstrative adjective, in grammar, 1-19.

De Morgan, William (1839-1917). Brit. novelist; for 30 years an artist-potter; began to write at 65, for amusement after illness; excels in naturalness of dialogue, but characters often more important than plot; *Joseph Vance*; *Alia-fur-Shori*; *Somehow Good*.

Demosthenes (383-322 B.C.). Athenian orator and statesman, 3-70, 4-77.

Demotic. Cursive writing used in anc. Egypt, simplification of hieratic, 2-1, 7-43.

Dempsey, Gen. Sir Miles C. (b. 1896). Brit. soldier; commanded Brit. 2nd Army from Normandy landings (June 1944) to disbandment, June 1945; c.-in-c. Allied Land Forces, S.E. Asia, 1945; c.-in-c. Middle East, 1946; retired 1947.

Dempsey, William Harrison ("Jack") (b. 1895). Amer. boxer. World heavyweight champion (1919-26). Beat Jess Willard (1919), Carpenter (1921) and twice lost on points to Gene Tunney (1926, 1927); 2-30.

Denain [den'ân]. Coal-mining and iron-mfg. tn. in N. Fr., 6 m. S.W. of Valenciennes; pop. 24,500.

Denarius. A Rom. coin of silver, later one of copper, the "penny" of the New Testament; "denarius" was Latin name given to Eng. penny; hence its initial (d.) became sign for pence.

Denbigh [den'bi]. Wales. Co. tn. of Denbighshire; dairying, boot and shoe mfrs.; castle, pop. 8,420; 3-71.

Denbighshire. Co. of Wales; area 668 sq. m.; pop. 169,000; co. tn. Denbigh, 3-71.

Dendritic pyrolusite, a mineral; crystals, 5-213 illus.

Deneb. Star of the first magnitude 7-146.

Denikin, Anton (1872-1917). Rus. general; after revolution followed Kornilov, later becoming anti-Bolshevik commander operating between Caspian and Black Seas (1919); defeated in 1920. Died in U.S.A.; 7-141.

Denis [den'is]. St. (Latin Dionysius), apostle to the Gauls (d. c. 275), first bishop of Paris, martyr and patron saint of France.

Denmark. Scandinavian kingdom of N.W. Europe; area 16,575 sq. m.; pop. 1,230,500, 3-72; flag, 3-384 illus. f.; Copenhagen, 2-501; children, 2-352 illus.; folk dance, 3-107 illus.; industries and transport, 3-74, 1-85; fire brigades, 3-363; history.

RULERS OF DENMARK SINCE UNION OF KALMAR

DENMARK, SWEDEN, & NORWAY

1397-1412 Margaret and Eric VII (XIII of Sweden)
1412-38 Eric VII (alone)
1438-40 [Interregnum]
1440-48 Christopher III
1448-81 Christian I
1481-1513 John
1513-23 Christian II (Sweden revolts and becomes independent 1523)

DENMARK AND NORWAY

1523-1533 Frederick I
1533-1559 Christian III
1559-1588 Frederick II
1588-1648 Christian IV
1648-1670 Frederick III
1670-1699 Christian V
1699-1730 Frederick IV
1730-1746 Christian VI
1746-1766 Frederick V
1766-1784 Christian VII
1808-1839 Frederick VI (regent 1784-1808); (Norway annexed to Sweden, 1814)

DENMARK

1839-1848 Christian VIII
1848-1863 Frederick VII
1863-1906 Christian IX
1906-1912 Frederick VIII
1912-1947 Christian X
1947- Frederick IX

DERRIS POWDER

3-74, 7-187; struggle with Hansentle League, 4-128; and Iceland, 4-234; Norway ceded to Sweden (1815), 5-165.

Dennis, C. J. (1876-1938). Australian poet and novelist, 1-321.

Density, in physics, 6-185.

Dent, Edward J. (b. 1876). Brit. musical critic and writer; translated many opera librettos.

Dentate. Bot. term for leaves with a toothed edge, 4-171.

Dentil. In architecture, small block or projection in the bed-mouldings of cornices in Ionic, Corinthian, Composite, and occasionally Doric orders.

Dentistry, early use of anesthetics, 1-142; dental amalgams, 1-116; X-rays and, 7-508 illus., careers in, 2-236.

Denver. Cap. of Colorado, U.S.A.; pop. 115,786; industries, 2-161.

Deodar, or Himalayan cedar, 2-285.

Deodorants. Substances that destroy or mask bad smells, 3-92.

Depressions, and weather, 5-180.

Deptford [dél'ford]. Met. bor. in S.E. London; Peter the Great worked in the dockyard, for long the most important in Eng.; pop. 75,694; 5-27.

Depth Charge. Anti-submarine weapon, cylinder containing high-explosive charge, dropped or fired overboard from ship or from aircraft and adjusted to explode at pre-determined depth, 1-294 illus.

De Quincey, Thomas (1785-1859). Eng. writer, 3-75; his style, 3-290.

Dérain, André (1880-1951). Fr. painter and stage designer. Member of Fauve group; later tendencies naturalistic.

Derbent or **Derbent** or **Derben**. Anc. Rus. city on Caspian in Daghestan A.S.S.R.; pop. 25,000, largely Mahomedan.

Derby, Edward Geoffrey Stanley, 14th Earl of (1799-1869). Brit. statesman, supporter of Reform Act of 1832, prime minister (Conservative) 1852, 1858-59, 1866-68; translated *Ibid.*

Derby, Edward George Stanley, 17th Earl of (1865-1918). Brit. politician, diplomat, race-horse owner; introduced the "Derby Scheme" as director-gen. of recruiting (1915-16); sec. of state for war (1916-18, 1922-23), ambassador to Fr. (1918-20). Succeeded by grandson, Edward John Stanley, Lord Stanley (b. 1918).

Derby, Frederick Arthur Stanley, 16th Earl of (1811-1908). Brit. statesman; held office under Disraeli and Salisbury; gov.-gen. of Canada 1888-92 (as Baron Stanley).

Derby. Co. tn. on Derwent; pop. 111,264; riv. workshops; noted for china; also aero-engine and silk mfrs.; 3-76.

Derby, The. Horse race run at Epsom, end of May or early June, 3-76, 4-198.

Derbyshire. Eng. co.; 1066 sq. m.; pop. 766,000; co. town Derby, 3-76; Dovedale, 2-86 illus.

Dermaptera (Zool.). Order of insects, including earwigs 4-270.

Dermot Mac Murrough (c. 1110-71). King of Leinster, pivot of first Eng. intervention in Ireland (1155-71); dethroned because he had carried off Devorgilla, wife of O'Rourke of Breffni; sought aid of Henry II.

Der'na. Small spt. of Cyrenaica, Libya, 100 m. w. of Tobruk; changed hands five times during the N. Africa campaign in 1941-42; 4-480, 7-489.

De Rougemont, Louis (1847-1921). Swiss adventurer, real name Henri Louis Grin. In 1898 caused sensation in London by account of 28 years among Australian aborigines. Story later discredited, but now believed true in part.

Déroulède, Paul (1846-1914). Fr. poet, dramatist and politician. A Bonapartist supporter, he founded nationalist League of Patriots; was banished 1900-05 for attempted coup d'état.

Derrick. Type of crane, 2-524.

Derris powder. Insecticide made from roots of a tropical plant, *Derris elliptica*; used against bot fly.

DERRYVEAGH

Derryveagh, Mts. Co. Donegal, Irish Rep., 4-284.

Derwish. A member of Mahomedan religious fraternity living in a monastery or wandering as a mendicant. The whirling dance of the dancing Derwishes (Mawlawiyeh) symbolises eternal existence of God.

Derwent, r. in Cumberland, flows into Irish Sea; 35 m. long, 3-10.

Derwent, r. in Derbyshire, trib. of the Trent, 60 m. long, 3-139.

Derwent, r. in Northumberland and Durham, trib. of the Tyne; 30 m. long.

Derwent, r. in North Riding of York shire, trib. of the Ouse; 70 m. long.

Derwentwater. Lake in Cumberland, 3 m. long and 1 m. wide, 4-439.

Desaix (doh's'), Louis (1768-1800). Fr. soldier, defended Kehl fortress in 1796 against the Austrians, and made possible Napoleon's success at Marengo, June 14, 1800, where he lost his life.

De Saussure, Horace Bénédict (1740-99). Swiss Alpine traveller and physicist; one of first to ascend to summit of Mont Blanc.

Descartes, René (1596-1650). Fr. philosopher and mathematician, 3-77, 6-160; and algebraic notation, 1-107; advances on Euclidean geometry, 3-518; influence on study of medicine, 5-162.

Deschanel [deshannel], Paul Eugene Louis (1856-1922). Fr. statesman and writer; Liberal leader; president of France, 1920.

Desdemona. Heroine and innocent young wife of Othello in Shakespeare's tragedy of that name, 6-49.

Desert Rat. Name for the Jerboa, common in N. Africa, adopted as badge by the 11th Hussars and later by the 8th Army's 7th Armoured Division in Second World War and after; 4-361 illus.

Deserts, 3 78; in Asia, 1 266; atmosphere and evaporation, 3-319; Sahara, 6 484; Boduin life, 1-192, 194 illus.

Desiderius, last king of Lombards (ruled 756-774).

Desmids, form of algae, 1 104.

Des Moines. Cap. of Iowa state, U.S.A.; pop. 177,965, 4-278.

Desmoulins [däsmölan], Camille (1760-94). Fr. politician and journalist; supporter of Danton in Fr. Revolution; was guillotined in 1794.

De Soto, Hernando (c. 1496-1512). Span. explorer of s.e. U.S.A., and discoverer of Mississippi r.

Despen'ser, Hugh le, the Elder (1262-1320). Eng. nobleman, leader of the Barons opposing Edward II; opposed execution of Gaveston; later himself chief adviser of king; arrogance and rapacity of his son Hugh the Younger largely responsible for their fall.

Dessie (doh'sä). Tn. of Abyssinia, in prov. of Shoa; in the Abyssinian campaign of 2nd World War, retreating Italian army fought sharp battle with S. Africans here; Dessie fell Apr. 26, 1941.

Destinn, Emmy (1878-1930). Czech soprano singer; sang in 1st production of *Madame Butterfly* at Covent Garden, 1905.

Destroyer. Type of warship, 5-344, 347 illus.; laying smoke screen, 5-352 illus.

Destructive distillation, of coal, 3-91.

Detarding, Sir Henri Wilhelm (1868-1939). Dutch financier, director of Royal Dutch Petroleum Co., and Shell Transport and Trading Co.; outstanding figure in the oil world.

Detergents. Cleansing agents, 3-76, 7-192; in forming foams and emulsions, 2-455; soap, 7-78.

Detmold. Tn. in North Rhine-Westphalia, W. Ger. Cap. of former principality of Lippe; pop. 17,800; cloth mfrs.; colossal statue of Hermann or Arminius, who defeated Romans, A.D. 9.

Detroit. Commercial city in Michigan, U.S.A.; pop. 1,849,969; 2-80; motor-car industry, 5-192, 7-368 illus.

Detroit River, U.S.A., connecting Lake St. Clair and Lake Erie.

Dettingen, vil. of Bavaria, on r. Main; battle (1743) in which George II was last Eng. king to lead troops; with Hanoverians, etc., he defeated Fr. Deucallion [dökal'lon]. Son of Prometheus; the "Noah" of Gk. myth., he built an ark and survived a flood sent by Zeus. From stones thrown by him and his wife Pyrrha sprang men and women respectively.

Dele, r. of N. Fr.; Lille on, 4-306.

Deuterium. Heavy isotope of hydrogen, of atomic mass 2; 4-221, 7-427.

Deuteron. The nucleus of a deuterium atom, which has twice the mass of the hydrogen nucleus; much used in the transmutation of elements by bombardment.

Deuteronomy, the fifth book of the Bible; contains last injunctions of Moses to his people.

Deutsche Mark. See Money (table).

Deutschland, Ger. name for Germany.

Deutschland über Alles (Germany above all). German national song, composed by A. H. Hoffman von Fallersleben in 1841; 5-326.

Deva Castro (Roin. tn.). See Chester.

De Valera, Eamon (b. 1882). Irish statesman, 3 80, 4-284.

De Valois (de val'wahl), Dame Ninette (b. 1898). Anglo-Irish choreographer; director of the Vic-Wells ballet; created *The Gods Go a-Begging*, *Job*, *The Rake's Progress*, *Promenade*, *Checkmate*.

Devaluation. Reduction of value of a currency in terms of other currencies, e.g. devaluation of £ sterling from 4 03 to 2 80 dollars, Sept. 1949; 3 419; 4-43.

Developing, in photography, 6-182.

Deventer, Netherlands. Quaint old tn. on Ysel; pop. 47,195; famous for "Deventer kock," a honey cake.

De Vere, Aubrey Thomas (1811-1902). Ir. poet, inspired by Gk. spirit and by Irish legends (*Irish Odes*; *Legends of St. Patrick*; *St. Peter's Chains*).

Deveron, river of Banffshire, Scot., 1-361.

Deviation, Magnetic, in compass, 2-475.

Devil or Satan, ruler of kingdom of evil, personification of spirit of evil

Devil-dance, in Mongolian monastery, 3 44 illus.

Devil fish. Name sometimes given to some of the large rays, 7 59, and sometimes to the octopus, 3-13.

Devil's Bible, The. MS. written on 300 asses' skins, 1-444.

Devil's bit (plant). See *under* Scabious.

Devil's coach-horse, a beetle, representative of family *Staphylinidae*, so called because when annoyed it raises the hind end of its body in a threatening manner. In summer small members of this tribe often swarm in thundery weather; they are the countryman's "thunder-bugs."

Devil's Island. Former Fr. convict settlement 30 m. off coast of Fr. Guiana; transportation to island ended 1946; last of convicts returned to France 1930; 4-103.

Devil's Mud, type of clay found in Cyprus; origin of name, 2-406.

Devizes, Eng. tn. in Wiltshire, on Kennet and Avon Canal; important corn trade; engineering and other industries; pop. 7,890.

Devolution, War of (1667-68), between Fr. and the Dutch republic; treaty of Aix-la-Chapelle (1668), 1-1.

Devon. Co. of Eng.; area 2,612 sq. m.; pop. 742,000; co. tn. Exeter; 3-81; china clay industry, 2-377; lace-making, 4-432.

Devon, r., tributary of the Trent, 4-476.

Devon, breed of cattle; cows and bulls rather small; oxen grow to great size and are prized for work, 2-274.

Devonian period. In geology, 3-515, 516.

Devonport. Tn. and fortified port on promontory in s.w. Devon; formerly

DHAULAGIRI

a borough, now part of Plymouth; large dockyard and naval arsenal; 6-329.

Devonshire, Edward William Spencer Cavendish, 10th Duke of (1856-1950). Under-sec. for Dominions (1936-40); for India and Burma (1940-42); sec. for Colonies (1943-45).

Devonshire, Elizabeth, Duchess of (1759-1824). One of the two beautiful Duchesses of Devonshire painted by Gainsborough; Elizabeth's portrait was the famous "Stolen Duchess," lost for 25 years.

Devonshire, Spencer Compton Cavendish, 8th Duke of (1838-1908). Brit. statesman, prominent in Victorian era; a Liberal, but opposed Gladstone's Home Rule policy; leader of Liberal Unionists.

Devonshire, Victor Christian William Cavendish, 9th Duke of (1868-1938). In House of Commons (1891-1930); civil lord of Admiralty (1915-16); gov.-gen. of Canada (1916-21); colonial sec. (1922-23).

Dew, 3-82; as cause of frost, 3-477.

Dewar, Sir James (1842-1923). Brit. physicist; inventor of original vacuum flask, 7 373; investigated liquefaction of gases and properties of matter at very low temperatures, with Sir Frederick Abel invented cordite.

Dewberry, bramble with fruit the bloom on which has a resemblance to dew.

De Wet (devet'), Christian (1851-1922). Boer general, c.-in-c. Orange Free State forces in Boer War (1899-1902); rebelled at outbreak of 1st World War, defeated and taken prisoner.

Dewey, Admiral George (1837-1917). U.S.A. naval commander in Span. Amer. War; he completely destroyed the Spanish fleet in Manila Bay without the loss of a ship or man.

Dewey, John (1859-1952). Amer. philosopher and educator, prof. of philosophy at Columbia Univ. 6 160.

Dewey, Thomas E. (b. 1902). Amer. lawyer and politician; gov. of New York in 1942; unsuccessful Republican candidate for president in 1944 against F. D. Roosevelt, in 1948 against H. S. Truman.

De Windt (de vint'), Harry (1856-1933). Brit. traveller; went by land from Peking to Calcutta; rode to India from Russia through Persia; visited mines and prisons of Siberia; travelled in Balkans, Sahara, Morocco; his journeys are described in many books.

De Wint, Peter (1784-1849). Brit. painter, 3-262.

De Winter, Jan Willem (1750-1812). Dutch admiral, in command at the battle of Camperdown (1797).

De Witt (de vit'), Jan (1625-72). Dutch statesman, grand pensionary for nearly 20 years; supported republicans against House of Orange; sought alliance with Louis XIV. lost influence when Fr. designs against Netherlands became apparent; killed by mob.

Dew-point hygrometer, 4-226.

Dewsbury. Town in Yorkshire, pop. 53,476; makes carpets, blankets, worsted.

Dexter, smallest breed of Brit. cattle 2-274.

Dextrin. A gum obtained from starch and so called because of its dextro-rotatory (rotating the plane of polarisation in a clockwise direction) effect on polarised light, 4-501.

Dextro-rotatory sugar, and polarisation of light, 4-501.

Dextrose (glucose or grape sugar), 7-186.

Dey Hussein (c. 1773-1833). Ruler of Algeria; and war with French 1-110.

Dona, Diego (1444-1523). Span. Inquisitor-general, 4-243.

Dzhnev, Cape, on Bering Strait, easternmost point of Asia, 1-265.

Dhaulagiri. Mt. in Himalayas on boundary of Nepal, 28,828 ft., 1-264.

DHOLE

Dhole [dōl]. Wild dog of India; differs from wolf by hair between toes and having a shorter muzzle.

Dhow. Arab sailing boat used for fishing and coastal trading, 1-499 illus.

Dibabase or greenstone. A granular igneous rock with lime-soda feldspar and pyroxene (augite) as its essential minerals; generally crystalline throughout; almost identical with basalt.

Diabetes. Disease; insulin as remedy for, 4-270.

Diacrisia purpurata. Moth, 2-143 illus.

Diacresis [di'akresis]. Two dots placed on second of two consecutive vowels to indicate that it forms separate syllable from the first, e.g. naïve.

Diaghilev [di'ah-gilef]. **Serge Pavlovich** (1872-1929). Russian impresario; through his presentation of Russian ballet to the world, Pavlova, Nijinsky, Karsavina, Massine, Lopokova, and Serge Lifar became famous; 1-352.

Diagnosis. In medicine, 5-165, 7-507, 508 with illus.

Dialogues of Plato, 6-222.

Dial system (automatic telephone), 7-245, 244, 216 illus.

Dialysis. Process used in chemistry for separation of crystalloids from colloids, using a semi-permeable membrane.

Diamagnetic materials. Anti-magnetic substances; bismuth, 5-83 with diag.

Diamagnetism, Faraday and, 3-311.

Diamond, 3-82, 7-164; atomic pattern of, and hardness, 2-219 with diag.; carbon in, 3-55; diamond cutting, 3-84, 1-141; Kimberley and Pretoria fields, 7-88; popularity in jewelry, 4-372; in wire infr., 7-462.

Diamond cutting, 3-84.

Diamond Necklace Affair. Historic Fr. political scandal, involving Marie Antoinette, in whose name the necklace had been fraudulently ordered through certain swindlers.

Diamonds, suit in playing cards; and piece of money symbol, 2-221.

Diamond Sculls. Principal sculling event in Brit. rowing calendar, instituted in 1944 and held during Henley Regatta.

Diana. Rom. goddess, the Huntress; identified with Gk. Artemis, 3-86; temple at Ephesus, 7-1, 3 illus.; shrine at Nem, and Golden Bough legend, 3-461.

Diana. Classical name for the moon 5-259.

Diaphragm [diafrām], dome-shaped muscle between lungs and abdomen; of gramophone, 4-58; in radio, 6-340 illus. f.

Diarbekir, Turkey. Tu. on Tigris; pop. 43,260; silk goods, gold and silver filigree.

Diary. Day-to-day record of personal events, reflections, etc., 3-8; John Evelyn, 3-319; Pepys, 6-121.

Diastolic pressure, of the blood, 1-492.

Diastrophism. Name given to movements of the earth's crust, 6-186.

Diatoms. Microscopic single-celled water plants, also known as phytoplankton, 1-448; as form of algae, 1-104; in Antarctic Ocean, 1-164; in plankton, 5-498, 499 illus., 6-216 illus. f.

Diatonic. See Musical Terms (table).

Diavolo, Fra [frah di'ah-vōlō]. ("Brother Devil") (1771-1806). It. brigand and renegade monk; subject of opera by Aubert.

Diaz [di'ahz]. **Armando** (1861-1928). It. general, commander-in-chief of It. armies in 1st World War.

Diaz, or **Dias de Novaes**, **Bartholomew** (d. 1500). Portuguese navigator, discoverer of Cape of Good Hope, 2-215, 1-53, 7-389, 7-382.

Diaz, Narcisse (1808-76). Fr. painter of the Barbizon school, 3-440.

Diaz, Porfirio (1830-1915). Pres. of Mexico; led successful rev. in 1871; pres. 1877-81, 1884-1910; in 1911 resigned in consequence of revolt by Madero; and Maximilian I., 6-189.

Diaz de Bivar, Rodrigo. See Cid, The.

Dib'din, **Charles** (1745-1814). Eng. poet, dramatist, and musical composer; wrote over 50 plays and many sea-songs, amongst the latter "Tom Bowling" and "Poor Jack."

Dicey, Albert Venn (1835-1922). Brit. jurist; Professor of Law at Oxford Univ.; wrote *Law of the Constitution*.

Dick, Sir William Reid (b. 1879). Brit. sculptor; pres. of Royal Soc. of Brit. Sculptors, 1933-38; works incl. Roosevelt memorial, Grosvenor Square, statue of George V, Westminster, and statue of Lady Godiva, Coventry.

Dickens, Charles (1812-70). English novelist, 3-86, 3-201, 5-172; associations with Rochester, 6-421; Kentish background to novels, 4-399.

Dickin Medal. The "Animals' V.C.", founded 1913 by Mrs. Maria Dickin, 1870-1951; awarded on official military, etc., recommendation. By 1951, 32 pigeons, 13 dogs, 3 horses and 1 cat (Simon of the *Amethyst*) had received it; 6-200.

Dickinson, Emily (1830-86). Amer. poetess, 7-366.

Dicotyledons. Plants with two or more seed leaves, 7-315, 6-329, 6-211.

"Dic'taphone." Sound-reproducing machine used in business houses for dictating letters, etc.; the words spoken into the mouthpiece are recorded on a wax cylinder, and reproduced to the typist by another machine.

Dictatorship. Govt. by one man or one party; in anc. Rome, 6-130; in modern Europe, 3-70.

Dictionary, of Chinese language, 2-365; Dr. Johnson's, 4-379; of slang, 7-61.

Didactic poetry, 6-235.

Diderot, Denis (1713-84). Fr. philosopher and writer; joint editor with d'Alembert of the great *Encyclopédie*, 3-155, 6-160.

Di'do or (Phoenician name) **Elis'aa**. Legendary Carthaginian queen; founder of Carthage, 2-255; and Aeneas, 1-25.

Dido and Aeneas. Opera by Purcell, 6-311.

Die Fledermaus. Opera by Johann Strauss; story, 5-516.

Diego Suarez [dyā'gō swai'ez]. Port of Madagascar, near S. end of island; good harbour; pop. 12,237; Fr. naval base and military h.q.

Dielectric. Substance which offers relatively high resistance to the passage of an electric current. Dielectrics separate the plates of a capacitor, 3-215.

Dielectric constant. See Permittivity.

Dielectric heating, 4-175.

Dieppe. Spt. and holiday resort on coast of Normandy. Fr.; pop. 21,170, 5-449.

Dies, for drawing wire, 7-462, 463 illus.

Diesel, Rudolph (1858-1913). Ger. engineer, inventor of diesel engine, 3-48.

Diesel-electric locomotive, parts, 5-5 illus. f.; Amer. engine, 5-12 illus. Royal Scot, 5-13 with illus.

Diesel Engine. Heavy oil internal combustion engine, 3-88; in lifeboats, 4-495; in "na. 7-30; in submarines, 7-175.

Diesel locomotive, 5-5, 8 illus.

Diet. A formal assembly or meeting; name often applied to legislative assemblies of Cent. and N. European countries; also the formal meetings of councillors of Holy Rom. Empire.

Diet. Food; and digestion, 3-90; balanced diet, 3-409.

Diethyl oxide. See Ether.

Differential, in motor vehicles, 5-278, 279 illus.

Diffraction, of light waves, 4-500; diffraction patterns of crystals, 3-5 with illus.

Diffusion. The tendency of two liquids or two gases to mix when brought into contact with each other.

Diffuordichloromethane ("Freon"), in refrigeration, 6-378.

DIOSCURI

Digestion, 3-89; digestive system in anatomy, 1-444; disorders diagnosed with bismuth meal, 1-475; study by X-ray, 7-507; enzymes in, 3-294; glands in, 4-27; liver and waste products, 4-521; and tongue, 7-280; in cattle, 2-273; in insects, 4-285; in ruminants, 6-471; of owl, 6-11.

Digges, Thomas (d. 1593). Master-master-general of army, and mathematician; and telescope 1-280.

Digitalin, an alkaloid poison, prepared from digitalis, 6-236.

Digitalis, heart stimulant prepared from foxgloves, 3-127.

Digitigrade animals, 5-100, 3-112.

Dinedral. See Aeronautics (table).

Dijon [di'zhawn]. Fortified tn. in France in dept. of Côte-d'Or; former cap. of Burgundy; pop. 100,604; mustard, wine.

Dik-dik. Pygmy antelope, 1-171.

Dikes. See Dykes.

Dill, **F.-M. Sir John G.** (1881-1911). Brit. soldier; Maj. 1910 C.I.G.S.; died when with Churchill in Washington and was buried in Arlington National Cemetery.

Dime. Silver currency unit of U.S.A. representing 10 cents.

Diminuendo. See Musical Terms.

Dimitrov, Georgi (1882-1949). Bulgarian Communist leader; prime minister 1946-49, 2-121.

Dimity. A fine cotton fabric with a reversible stripe or pattern raised on one side and depressed on the other; originally similar but heavy fabric made in Sp. for bed hangings.

Dina. See Money (table).

Dinant [dinānt]. Tn. in Belgium, in prov. of Namur, on Meuse; pop. 7,000; 1-117 illus.

Dinar. See Money (table).

Dinaric Alps. Mts. in W. Yugoslavia; highest pt. Dinaia (6,008 ft.); 3-309.

D'Indy [dāndē], **Vincent** (1851-1931). Fr. composer; pupil of César Franck; noted for rich and subtle instrumentation ("La Forêt Enchantée"; "Symphonie sur un air montagnard français").

Dingaan (1828-40). Zulu king, 5-325, 7-527.

Dinghy, small rowing or sailing boat, 7-509. See also Nautical Terms.

Dingle Bay. Inlet of co. Kerry, Irish Rep. Dingle, a spt. and fisheries centre, lies on the north side.

Dingo. Wild dog of Australia; skin for gloves, 4-36; 1-312, 3-103.

Dingwall, Co. tn. of Ross and Cromarty, Scot.; pop. 3,307, 6-455.

Dingy Skipper, butterfly, 2-139 illus.

Dinosaur. Prehistoric animal of great size, 6-281, 3-516, 3-421 illus., 7-446 illus.

Diocese. A bishop's district; the name was first used in this sense at the beginning of the 4th cent.; in Church of Eng. 2-386.

Dioecetan [diōklē'shan] (A.D. 245-313). Rom. emperor (284-305), able soldier, and energetic ruler, under whom a memorable persecution of Christians took place; rule, 6-439; palace at Spalato, 1-14; persecution of Christians, 2-379.

Diode. A two electrode thermionic valve, 7-376 with illus.

Diogenes [diōj'enēs] (c. 412-323 B.C.). (Gk. philosopher, 3-91, 6-160.

Dionysius the Elder (430-367 B.C.). Tyrant of Syracuse; a cruel despot; pardons Damon and Pythias, 3-36; and Democles, 3-36.

Dionysus. Gk. god of vegetation and wine; the Rom. Liber, or Baccus, 3-91; and the drama, 3-115; theatre at Athens, 7-263, 1-287; and Midas, 5-198.

Diophantus. Gk. mathematician of 3rd or 4th cent. A.D., "father of algebra."

Diorite. Igneous rock. Harder than granite and grey or green in colour. It was used for making weapons and implements by the Swiss lake-dwellers; by the Sumerians for statues; by the Babylonians for carving written records; and by the ancient Egyptians for urns.

Dioscouri. See Castor and Pollux.

DIPLODOCUS

Diplodocus. A huge prehistoric reptile that was native to N. Amer.; it was some 60 ft. long from head to tail; head about 2 ft., tail about 25 ft., 6-281.

Diplomatic immunity. Immunity of ambassadorial staffs from arrest or prosecution, 1-131.

Diplopoda. A class of arthropods including millepedes ("thousand feet"); some authorities place millepedes in sub-class *Diplopoda* of class *Myriapoda*, which contains centipedes as well.

Dip needle. A magnetic needle used for measuring the vertical component of the earth's magnetism at different places; it is balanced beside a dial horizontally and dips towards a vertical position in proportion to the power of magnetism exercised; horizontal only at magnetic equator.

Dipper (constellation). See *Plough*.

Dipper. A small bird of the family *Cinclidae*; typical of N. streams; plumage black above, white breast, red beneath; earliest Brit. bird to nest in spring.

Diptera. Order of two-winged insects, 3-102, 4-264, 4-270.

Direct Current. An electric current which flows in one direction only and is free from pulsations, 3-213; generation of, 3-144; in electric motors, 5-275; self-induction in, 3-216.

Directory, The. Fr. Committee of 5 which held executive power in Fr. (1795-99); overthrown by Napoleon, 3-152 with illus., 3-169.

Dirigible. See *Airship*.

Dirk. Short dagger worn by Scot. highlanders in nat. dress, tucked in the stocking; also short sword worn by midshipmen.

Dirt, removal by detergents, 3-78.

Dirt-track racing, 5-274 illus.

Dis. Rom. god of underworld, the Gk. Pluto.

Disarmament Conference of 1932. International conference at Geneva to plan reduction of world armaments. A draft convention for substantial disarmament over a period of eight years was put forward by Ramsay MacDonald; adopted unanimously,

June 1933, but Germany withdrew and the conference was postponed indefinitely.

Discharge. The process of taking electrical energy from a charged storage battery; also, to cause any conductor or apparatus which has received a charge to return such charge; of cell, 1-386.

Discharge lamps, ions in, 4-277.

Discharge Tube. Any device provided with electrodes and in which an electric discharge takes place in a vacuum or in a gas at low pressure if a sufficiently high voltage is applied to the electrodes. Examples are thermionic valves, cathode-ray tubes, and the gas-discharge or fluorescent lamp.

Discobolos or Disc-thrower; Greek statue, 4-81, 89.

Discovery. Capt. Scott's ship in which he sailed to the Antarctic, 6-515, 6-241 illus.

Disc-plough, agricultural implement 6-225 with illus.

Discus. In athletics; standard performances 1-290, 292, 291 illus.

PRINCIPAL BREEDS OF DOGS

Afghan Hound.—Long, fine-haired, long-eared coursing dog, bred for centuries in Afghanistan.*

Airedale Terrier.—Large terrier with wiry coat; tan with black or grizzled saddle; excellent police- and watch-dog.

Alsatian.—Large dog with wolf-like head; black, white, grey, or mixed; very intelligent; originally German shepherd-dogs; excellent as guards and guide-dogs for the blind.

Australian Terrier. Toy breed; small, silk-haired, active dog; long, flat head, with high-set ears.

Basset.—A small, short-legged, long-eared, smooth-coated hunting dog.

Beagle.—A small sturdy hound, with smooth coat and long ears.

Bedlington Terrier. Wiry-haired terrier with long ears and silky topknot; about 15 inches tall. Blue-grey, liver, or tan.

Black-and-tan, or Rat Terrier.—Smooth black coat marked with tan; miniature of Manchester terrier.

Bloodhound.—Good-sized dog black and tan or red-brown and tan; smooth hair, and loose skin lying in folds on forehead; long ears and chops, giving a mournful expression; keen scent.

Border Terrier.—Small, wiry-haired terrier from the borderland of England and Scotland.

Borzoi.—Large, graceful, narrow-headed, long-snouted Russian hunting dog. Silky-coated, and capable of great speed.

Boston Terrier.—Smooth coat, short head, with erect ears, brindle to black with white markings; both toy and medium-sized varieties. National dog of U.S.A.

Boxer.—Of German origin medium size, smooth-coated, with powerful body. Colours are shades of red, fawn, and brindle. Nose is turned up, jaw slightly undershot.

Bulldog.—Low, heavy dog with undershot jaw, and retreating nose.

Bulldog, French. Small bulldog with upstanding "bat" ears.

Bullmastiff.—Big, powerful smooth-coated, descended from mastiff and bulldog, with mastiff body and colours, but short nose.

Bull Terrier.—White or brindle, smooth-coated, medium size; agile and courageous.

Cairn Terrier.—A small terrier from Scotland, having a long harsh coat.

Chow Chow, or Chow Dog. Native of northern China, of medium size and sturdy build, with large broad head, short erect ears, blue-black tongue, thick hair and bushy up-curved tail; usually reddish-brown or black.

Collie.—Large, thick-furred, with long tapering nose; golden-brown with white mane, or tan, black and white, or all white; much used for herding; the smooth-coated collie is rarer.

Corgi, Welsh.—Short-legged, smooth-coated, highly intelligent farm or domestic dog.

Dachshund.—Short-legged, long-bodied German dog, with hound-like head.

Dalmatian.—Strong, muscular, with short, smooth hair; white with black or liver-coloured spots; also called "plum-pudding" dog.

Dandie Dinmont Terrier, Scottish.—Long-bodied, short-legged, with rough coat, silky topknot, long ears; pepper or mustard colour.

Deerhound, Scottish.—A large hunting dog, more heavily built than a greyhound, and with rough coat.

Dingo.—Wild dog of Australia, which is destroyed as a pest because it kills sheep; some have been domesticated.

Elkhound, Norwegian.—One of the wolf-like dogs from which shepherd breeds have been developed.

Eskimo Dogs.—Several kinds of wolf-like dogs used to pull sledges; malamute, husky, and North Greenland Eskimo are varieties.

Foxhound.—An able hunting dog; their splashed coats and baying voices are known wherever foxes are hunted.

Fox Terrier.—A small, sturdy, active dog; one variety smooth-coated, the other wire-haired; white with black-and-tan markings.

Great Dane. A very large strong dog, agile and symmetrical, with head carried high; hair short; brindle, fawn, grey, black, white, or white with black patches (harlequin).

Greyhound. Fleet, slim, long-limbed coursing dog, used from ancient Egyptian days; brindle, fawn, black, and white.

Griffon.—Rough-coated German or French hunting dogs.

Griffon, Brussels. A small rough-coated toy dog, reddish brown; pug nose; heavy "moustaches."

Harrier.—Dog resembling foxhound, but smaller; used for hunting hares.

Irish Terrier.—Medium size, rough hair of reddish colour; noted for gameness.

Keeshond.—Chow-like dog, medium in size between chow and pomeranian. Also called wolf spitz, or Dutch barge dog.

Kerry Blue Terrier.—Irish dog with soft coat of bluish tint. V-shaped drooping ears; water-dog. Puppies are born black.

Lakeland Terrier.—Black or blue and tan, or grizzle or black, miniature Airedale. Used for fox-hunting in Fell country.

Maltese.—Active toy dog, of sharp terrier appearance, with long silky white hair.

Manchester Terrier.—Medium-sized, smooth-coated, black with mahogany tan markings. (See Black-and-tan).

Mastiff.—Ancient breed, large, powerful, from which many other breeds have been developed. About 30 ins. high at the shoulder. Coat short, fawn or brindle.

DISEASE

Disease, and bacteria, 1-314; germs and, 4-11; spread by insects, 3-388, 4-270; malaria, 5-91; and X-rays, 7-507.
Disinfectants, 3-91; and germs, 1-176.
Dislocation, of bone; first aid for, 3-368.
Disney, Walt (b. 1901), U.S. film producer and cartoonist, 3-92.
Dispersion, of light, 4-501.
Displaced Person. Any person deported from his country of origin. Term first used, 1945, of those moved from their homes by Nazi and Fascist regimes; at end of war in Europe there were some 7½ million displaced persons.
Disraeli, Benjamin, Earl of Beaconsfield (1804-81) [dis'ra'li]. Brit. statesman and novelist, a close friend of Queen Victoria, 3-93, 7-350, 7-396; rivalry with Gladstone, 4-26; Primrose Day, 6-258; and Suez canal, 7-181.
D'Israeli, Isaac (1766-1818), Brit. author, of Jewish parentage; father of Benjamin Disraeli, Earl of Beaconsfield.
Dissection, in anatomy, 1-143, 5-161.

Dissent'ers. Old name for those who refused to comply with usages of Church of Eng. Term generally superceded by "Nonconformists," later by "Free Churchmen." See **Free Churches**.
Dissociation, of molecules, 4-278.
Dissolution of the Monasteries (1539) 1-3.
Distaff. Staff used in hand spinning.
Distemper. Form of water paint, 6-39.
Distillation and Distilling, 3-93, 7-137; of petroleum, 6-150.
Distinguished Conduot Medal (D.C.M.). Brit. decoration, 5-530.
Distinguished Flying Cross (D.F.C.). Brit. decoration, 5-530.
Distinguished Flying Medal (D.F.M.). Brit. decoration, 5-530.
Distinguished Service Cross (D.S.C.). Brit. decoration, 5-530.
Distinguished Service Medal (D.S.M.). Brit. decoration, 5-530.
Distinguished Service Order (D.S.O.). Brit. decoration, 5-530.
Distrene, a plastic, 6-220.
Distressed, Special or Development Areas. Regions principally affected

DIVER

by the economic crisis of 1929-31—such as S. Wales, Tyneside, Scotland etc. New industries were established in "estates" therein, and surplus labour transferred elsewhere.
Distribution. In economics, 3-159.
Distributive law, in algebra, 1-104.
Distributor, in internal combustion engine, 4-274, 5-277.
District heating, Battersea power stn. and, 4-151, 150 illus.
District nursing, as a career, 5-186.
District of Columbia (D.C.). Federal district containing Washington, cap. of U.S.A.; area 69 sq. m.; pop. 802,178, 7-422.
Ditchling Beacon. Highest point of, Sussex S. Downs, 7-196.
Dithyramb. (Gk. choral lyric; and tragedy, 3-115.
Diu. Port, possession on the coast of Gujarat, India, 6-268.
Dive-bombing, 1-511.
Diver. Bird of the order *Garniformes*: Brit. species include Gt. Northern diver or loon, red- and black-throated divers.

PRINCIPAL BREEDS OF DOGS—concluded

Newfoundland.—Massive head and square muzzle; long thick hair; usually black, or black and white.
Old English Sheep-dog.—Moderate size, with broad head, thick-set body and long shaggy hair which falls over face and eyes.

Otterhound. Large, with head similar to bloodhound; thick wavy greyish coat.

Papillon, or Butterfly Dog.—Toy dog with abundant silky coat; long bushy tail, and ear resembling a butterfly.

Pekinese.—Small lap-dog with long silky hair, broad head, short muzzle, large protruding eyes, squat legs; reddish, fawn, black, sable, and mixed.

Pinscher, Doberman.—Smooth, moderately large, muscular; black-and-tan, or brown; developed in 26th century in Germany; used there as a police dog; one miniature variety.

Pointer. Excellent shooting dog developed from Spanish pointers and speedy foxhounds; smooth coat; white with black, liver, or lemon markings.

Pomeranian.—Toy, long-haired dog, with fox-like expression; sable or orange usual colours; differs from Spitz chiefly in size.

Poodle.—Curly-haired, usually white or black; often displaying intelligence especially in learning tricks; toy, curly, and corded varieties; usually clipped.

Pug.—Small with round head and short blunt square muzzle; fawn with black shading, or black.

Pyrenean Mountain Dog.—Very large, with heavy long coat, which is white, with occasionally slight lemon markings. Used as sheep dog in the Basque country.

Retrievers.—Dogs trained to retrieve dead or wounded game; large, usually black or liver-coloured, resembling Newfoundland and setter; varieties are the curly-coated, flat-coated, and Labrador retrievers.

St. Bernard.—Very large, with massive head; either long and rough, or smooth coat; originally bred at the Hospice of St. Bernard in the Alps.

Saluki or Persian Gazelle Hound.—One of the oldest historic breeds; introduced into the West from the Orient; large, speedy and graceful, like the greyhound, with silky coat.

Samoyed. A strong, medium-sized, thick-furred white dog from Asiatic Russia. Used as sledge dog.

Schipperke.—Small, black, with fox-like head, erect ears, square and firmly-built body, thick hair, docked tail; name is Flemish for "little skipper," coming from its use in Flanders as watch-dog on barges.

Schnauzer.—Strongly-built German dog; pepper and -it colouring; wire coat, bristling moustache and beard; miniature, medium and giant, or *Besenschauzer* varieties.

Scotch Terrier.—Long stocky body and short legs; rough hair; black, grey, sandy, or grizzled.

Sealyham Terrier. Developed in Wales; long body, short sturdy legs, wiry hair; mainly white, with markings of brown, tan or yellow.

Setter, English.—Sporting dog, medium size, long coat; white with liver, tan, orange, or black blotches.

Setter, Gordon or Black-and-tan.—Similar to English setter; coat black with mahogany-tan markings.

Setter, Irish.—Somewhat lighter in build than the English setter, with long, flat, glistening red-brown coat.

Shetland Sheep-dog.—A small collie.

Skye Terrier.—Small with long, hard hair falling to the ground; Clydesdale terrier similar but with silky hair.

Spaniel, Blenheim.—White and chestnut, or all chestnut, variety of King Charles spaniel.

Spaniel, Cavalier King Charles.—Early type of toy spaniel, popular at court of King Charles II. Colours,

Blenheim (white with chestnut markings), ruby, black-and-tan, and tricolour. Has long muzzle, unlike King Charles spaniel.

Spaniel, Clumber.—Medium height with massive head and frame; white with lemon or orange markings.

Spaniel, Cocker.—Moderate-sized varied colour markings; long drooping ears; broad feet; quick and alert.

Spaniel, English Toy. Round head and pug face; varieties: King Charles, black and deep brown; Prince Charles, white with black-and-tan markings; Ruby, mahogany bay; Blenheim, white with chestnut markings.

Spaniel, Field. Larger, heavier, and stronger than Cocker spaniel; all black, or white with black or other markings.

Spaniel, Irish Water.—Curly liver-coloured coat, smooth face, and curly topknot; excellent water dog.

Spaniel, Japanese. Resembles Pekinese; black, or yellow and white.

Spaniel, King Charles.—Black-and-tan, or white, black, and tan, closely resembling Japanese.

Spaniel, Springer. So named because it was formerly used to drive out or "spring" the game; it now points; English and Welsh varieties.

Spaniel, Sussex.—Massive muscular hunter with abundant golden-liver coat.

Spitz.—Medium-size; heavy up-standing coat; probably related to Samoyed.

Welsh Terrier.—Wire-haired, resembles fox terrier; coloured like Airedale.

West Highland White Terrier.—Small with long body and short, muscular legs; white wiry coat.

Whippet.—Bred for racing; crossed from the greyhound and terrier.

Wolfhound, Irish.—Resembles deerhound, but more massive; the tallest of all dogs.

Yorkshire Terrier.—A toy, long-haired terrier.

DIVERS' BENDS

Divers' bends. Malady of divers, caused by reduction of water pressure on surfacing; nitrogen and, 3-95.

Dives (div'vix) (Latin, "rich"). Popular name of rich man in parable of Lazarus (Luke xvi, 19-31).

Divide. In physical geography, ridge or height of land separating the headstreams of one drainage system from those of another.

Dividing Range. N.S.W., Australia, 5-402.

Divye. R. of Scot., tributary of the Findhorn; salmon fishing, 5 261.

Divine Comedy. Poem by Dante, 3-46, 47.

Divine Right of Kings. James I. 4-339; Richelieu and, 3-450.

Diving. 3-94; and swimming, 7-210, 208, 209 illus.

Diving suit, types of. 3-94, 95 with illus.

Divining rod. See Dowsing.

Division. In arithmetic, 3 96; of decimals, 3-58; of fractions, 3 430.

Division. in House of Commons, 6 90.

Division. Army formation; in British army, 1-253.

Divorce. Legal breaking of marriage bond, 5-135.

Diwan-Am. hall of public audience, Delhi, India, 3-66 with illus.

Dixmude. Tn. of Belgium on Yser Canal; scene of severe fighting in 1st World War.

Djebel Nakur. or Bell Mt. in Arabia; "chiming" sands, 6-456.

Djibouti. See Jibuti.

Dmitri (Tsar). See Demitrius.

Dniester. R. of Russia, flowing 1,410 m. to Black Sea, 6-172.

Dniester Dam. Ukraine, S.S.R., 6-479.

Dnipropetrovsk (formerly Ekaterinoslav). Tn. of Ukraine S.S.R., on r. Dniester; in centre of great mineral region; built by Potemkin, 6-474.

Dniester (nést'er). R. of E. Europe; rises in Carpathian Mts., flows 4,785 m. to Black Sea; rich in fish, 6-472.

Dobruja (dóbrú'ja). Agric. dist. now divided between Bulgaria and Rumania on Black Sea, s. Dobruja is Bulgarian, and n. Dobruja is Rumanian, by treaty of 1940; 8,900 sq. m.; pop. about 700,000; 2 121.

Dobson, Frank (b. 1887). Brit. sculptor, 6-524; most celebrated work Truth stands outside Tate Gallery.

Dobson, Henry Austin (1840-1921). Brit. poet and essayist; delicate satire and graceful handling of artificial & verse forms (*Proverbs in Prose*; *Old World Idylls*; *At the Sign of the Lyre*).

Dock. A coarse woody herb of the genus *Rumex*, from 2 to 1 ft. high; flowers small and greenish, growing in panicles; leaves usually long and lance-shaped.

Docks. 3-97; cranes in, 2-525; pent dock, 4-131; Hull, 4 202 illus.; London, 5-20; Southampton, 7 101 illus. See also Harbours.

Doctor. One skilled or learned in any profession; in general speech indicates a person qualified to practise in medicine; Hippocratic Oath, 4-179; career as, 2-238.

Doctor, The. Variety of rose, 6-452 illus f.

Dr. Faustus. Tragedy by Christopher Marlowe, 5-133.

Dr. Jekyll and Mr. Hyde (1886). Story by R. L. Stevenson of a man with dual personality. He appears both as Dr. Jekyll, the kindly physician, and as Mr. Hyde the murderous maniac.

Documentary film. development in Gt. Brit., 2-401.

Dodder. Parasitic plant, 5-444, 6-738.

Dodecanese ("12 islands"). Small isls. in Aegean Sea; seized by Italy in 1911; Germans invaded in 1913; occupied by Allies in 1945; ceded to Greece in 1947, 1-25.

Dodgson, Charles Lutwidge. See Carroll, Lewis.

Dodo. Extinct bird, once found in Mauritius, 3-100, 6-149.

Dodo'sa. Anc. city of Epirus, Greece; seat of ancient oracle of Zeus.

Doddsley, Robert (1703-64). Eng. book-seller and publisher; and Dr. Johnson, 4-370.

Doe. Female deer; also female rabbit.

Doenitz, Karl (b. 1891). U-boat commander, 1918-1918; commander of cruiser *Emden*, 1929; admiral, 1942; grand admiral and c.-in-c. German navy, 1943; in May 1945 became Hitler's successor as leader of Germany. Tried as war criminal, Nuremberg, 1945-46; sentenced to 10 years' imprisonment.

Doffing. Process in cotton mft., 2-520.

Dog. 3-100, 3-100, 101 illus. f.; claws, 5-102; dominant colour, 4-168; eye, 3-333 illus.; skin, 7 63; in sleep, 7-67; guide dog, 6-349 illus.; police dog, 6-252 illus.; and sound, 7-343. See also Dogs (list, p. 288).

Dog Days. Period of hot weather in July and August, when the dog star Sirius rises with sun.

Doge [dóij]. Elective duke or chief magistrate of the city-republics of Venice and Genoa during Middle Ages.

Doge's Palace. in Venice; where former rulers of Venice held their court; begun 1301, took two centuries to complete, 7-387, 389 illus. f.

Dog-fish. Member of the shark family; reproduction, 7-18; habits, 3-379; egg, 3-171 diag.

Dogger Bank. Extensive sandbank and fishing ground in North Sea, 5-460 with diag.

Doggett's Coat and Badge. Annual race on r. Thames for London watermen, rowed from London Bridge to Chelsea. Prize is a new coat and badge named after Thomas Doggett, an Irish actor, who instituted the race in 1715; 6-459.

Dog mushroom. a fungus, 3 488 illus. f.

Dog rose. Wild rose found in Brit., 6-453, 2-24 illus. f.

Dog star. See Sirius.

Dog-tooth. In architecture, ornament used in medieval hollow mouldings, consisting of a series of tabs usually resembling teeth, but sometimes elaborate floral designs.

Dog Violet. 7-401 illus.

Dog watch. Nautical term applied to two two-hour watches on board ship, the first 4-6 p.m., the second 6-8 p.m. Other watches are of 4 hours.

Dogwood. A hard-wooded shrub, *Cornus sanguinea*, distinguishable by bright red twigs, opposite leaves, and white flowers; leaves dark red in autumn, berries black.

Doherty, Reginald (1872-1911) and **Hugh Lawrence** (1876-1919). British lawn-tennis players, 4-461.

Doldrums. Belt of calms round the equator; weather is hot and sultry; sailing ships were often becalmed there for weeks, 7-458 with illus.; rain storms, 6-360.

"Dole." Colloquial term for unemployment benefit. In ancient Rome it really meant a free gift, but unemployed who receive it to-day have subscribed to it at least in part.

Dolgellay [dolgeth'li]. Wales. Co. tn. of Merionethshire, near Cader Idris; associations with Owen Glendower; fellmongering and wool trade; pop. 2,216; 5-175.

Doll. 3-104; puppets, 6-310; Queen Mary's doll's house, 3-105 illus. f.

Dollar (sign \$). The monetary unit in the U.S.A. and Canada, established as such in the U.S.A. by the Coinage Act of 1792; before that date Sp. dollars were used in the colonies; in the 15th cent. large silver coins struck in Joachimsthal, Bohemia, were called "thalers," from which, through the low Ger. "daler," the word "dollar" came into use; dollar Mex (Chinese dollar), 5-187.

Dollfus, Engelbert (1892-1934). Austrian chancellor and unofficial dictator (1932); died Austrian Nazis assassinated in 1934; 1-324, 7-399.

Dolmen. Megalithic monument, 7-162 illus.

DONCASTER

Dolmetsch, Arnold (1858-1940). Fr. musician and maker of musical instruments; inaugurated at Haslemere, Surrey, 1925, an annual music festival devoted to music of the 16th, 17th, and 18th centuries; started in 1908 Dolmetsch foundation for training scholars and craftsmen to meet demand for Dolmetsch instruments; and the harpsichord, 6-194; Dolmetsch family playing recorders, 5-308 illus.

Dolomite. Form of limestone, 4-510 5-81.

Dolomites (from mineral dolomite) Limestone mts. in s. Tirol Alps, highest peak Marmolata (10,972 ft.), 7-281 with illus.

Dolphin. Sea mammal, 3-105; compared with porpoise, 6-265.

Domagk, Gerhard (b. 1895). Ger. physician and research chemist, discovered prontosil, the first of the sulpha drugs; Nobel prize for med. 1939; 5-165.

Dome. In architecture; Roman development, 1-209; of St. Paul's cath., 6-487.

Domenichino [dómānik'h'nō]. Zampieri (1581-1641). It. painter, excelled in religious frescoes; one of earliest landscape painters; with Guido Reni most distinguished follower of the Carracci; 4-320.

Dome of the Rock. The. Mosque Jerusalem, 4 362.

Domesday Book. William the Conqueror's statistical record of England 3-105, 2 291, 7 461.

Domestic work. as a career, 2 232, 236.

Dominant characteristics. in heredity 4 168, 5-169.

Domini's, St. (1170-1221). Sp. priest, founded Dominican Order of Preaching Friars; festival, Aug. 4.

Dominoes. Brit. isl. in Windward Isls., W. Indies, 2-167; native boats, 1-500 illus.

Dominican friars. 5-245; and Oxford univ., 6-17.

Dominican Republic. Part of the I. of Hispaniola, W. Indies; area 19,322 sq. m.; pop. 2,500,000; cap. Ciudad Trujillo, 3 106; maj. 4-118; flag, 3-385 illus. f.

Dominicans. Order of monks; and Inquisition, 4-263.

Dominion Day. Canadian nat. holiday, July 1, anniversary of formation of Dominion, July 1, 1867.

Dominoes. A game, 3 107.

Domitian [dómish'm] (A.D. 51-96). Rom. emperor (81-96); murdered for his cruelties; the Apostle John was probably banished to Patmos during his reign; 6-439; and Agricola, 1-60.

Domrémy-la-Pucelle. Village in France, birthplace of Joan of Arc, 4-376.

Don. R. in s. Russia, rises in L. Tura flows s.e. and s.w., 1,325 m. into Sea of Azov; the ancient Tanais, navigable for 800 m.; valuable fisheries; 63 m. canal connects with Volga; 6-472.

Don. R. of Aberdeenshire, Scot. 78 m. long; fishing, 1-5, 6-510.

Don. R. in Yorks, Eng., tributary of the Ouse; 70 m. long; navigable for 39 m.

Donald Duck. Film cartoon character 3-92.

Donar. The Teutonic thunder-god identified with Thor, 7-270.

Donatello [donatē'lō] (1386-1466). Florentine sculptor whose works are supreme expression of spirit of the early Renaissance; statue of St. George, 4-320, 6-519 illus.

Donati [dónā'tā]. Giovanni (1826-73). It. astronomer, director of Florence observatory (1864). Discovered 8 comets, one named after him.

Donati's Comet. Discovered by Giovanni Donati (above) in 1858, 45,000,000 m. long by 10,000,000 wide; last seen in 1858; 2-471 illus.

Donbas. Contracted name for basin of the r. Donets, s. Russia, an important industrial region of Ukraine, 6-473.

Doncaster. Tn. in West Riding, Yorkshire, on r. Don; large town.

DONEGAL

and machinery works; racecourse, on which St. Leger is run; pop. 81,894.

Donegal. Extreme N.W. co. of Irish Rep.; includes many isles offshore; area, 1,865 sq. m.; pop. 131,500; much of the land is marsh or bog; agriculture, cattle-rearing, weaving of linens and tweeds are chief industries; 4-284.

Donegal Bay. Inlet of W. coast, Irish Rep., 30 m. wide at entrance; valuable fishing ground.

Donetz (dunetz). R. in s. Russia; flowing S.E. 670 m. to join r. Don near Shakhtal.

Don Giovanni. Opera by Mozart; story, 5-516.

Donington Park. Former motor-racing road circuit in grounds of Donington Hall, near Castle Donington, Leics., opened in 1933, ceased as race track in 1939.

Donizetti (dōnēdzet'fē). Gaetano (1797-1848). It. operatic composer; wrote 70 operas; combined an endless flow of melody with dramatic talent and power of humorous characterization; 5-514; *Lucia di Lammermoor*, 5-517.

Don Juan. Poem by Byron. 2-148.

Donkey, and thistles. 7-270. *See also* Ass.

Donne, John (1573-1631). Eng. poet and priest; in youth wrote metaphysical love poetry and brilliant *Satires*; in later years composed the religious verse; at 41 took orders, became dean of St. Paul's, and most popular preacher of his day; 3-285.

Donnybrook. A part of the city of Dublin, Irish Rep.; famous for its fair, started 1204, held annually, notorious for its attendant fighting and debauchery; abolished in 1855.

Dono, Paolo di. *See* Uccello.

Donoghue, Stephen (1884-1945). Brit. jockey. At one time or another he rode the winners of all the classic flat races and rode the Derby winner on six occasions between 1915 and 1925. In 1920 he rode 143 winners.

Don Quixote. Great Spanish romance and satire by Cervantes, 2-294, 7-121; story retold, 2-295.

Don-Volga, or Lenin, Canal. Inland waterway connecting Kalatch on the Don to Stalingrad on the Volga; completed 1952, is 63 m. long.

Donzere-Mondragon scheme. Hydro-electric scheme on the Rhône r., France, 4-220, 6-396.

Doodlebug (nickname). *See* Flying Bomb.

Doon. River and loch of Ayrshire, Scot., flowing N.W. 30 m. into Firth of Clyde.

Doone Valley, in Exmoor, made famous by R. D. Blackmore's *Lorna Doone*.

Doorn. Vil. near Amerongen in the Netherlands; 1920-41 the residence of ex-Kaiser William II.

Doppler Effect. Characteristic of most forms of wave motion. In a sound wave, it is the change of pitch or frequency received by an observer, due to relative motion between the hearer and the sound source. Thus the whistle of a moving train appears to be higher in pitch when coming towards the hearer than when going away from him. The same peculiarity holds good for light waves, the frequency of which appears greater to an observer approaching the light source than it does to an observer moving away from it. Doppler's effect was discovered in 1842 by the Austrian physicist Christian Doppler (1803-1853) after whom it was named.

Dorcas or Tabitha. Follower of Jesus at Joppa, a woman "full of good works" (whence the "Dorcas societies" of the Church), raised from the dead by Peter (Acts ix. 36-40).

Dorchester. Co. tn. of Dorset, Eng.; pop. 11,623, 3-107.

Dorchester. Vil. of Oxfordshire; beautiful old abbey with famous Jesse window.

Dordogne (dōrdōn'ye). R. in s.-cent.

Fr., 365 m. long; unites with Garonne.

Dordrecht. Tn. in Netherlands; pop. 70,793, 5-372.

Doré (dōr'ā). Gustave (1833-83). Fr. painter and illustrator, famous for vivid imagination and grotesque humour with which he illustrated the world's classics; illus. for *Don Quixote*, 3-295, 296, 297; *Samson and the Lion*, 6-495 illus.

Dor-hawk. *See* Nightjar.

Doria (dōr'ā). Andrea (1466-1560). Genoese admiral and patriot, soldier of fortune under Francis I of France and the Emperor Charles V; drove French from Genoa and set up republic of which he became perpetual censor; exercised predominant influence until his death.

Dorians. One of four great branches of (Akk.) people; took name from Dorus, son of Helen; came from S. or S.W. and invaded Corinth, then Crete; Spartans always regarded as representatives of unmixed Dorian blood.

Doric. Dialect of anc. Greece, 4-71.

Doric. Earliest of the three great Greek styles in architecture, 5-532, 531 illus.; temple, 4-82 illus.

Dormer. *See* Architectural terms.

Dormouse. Small rodent. 3-107; hibernation, 4-173.

Dornier. Type of German bomber in 2nd World War, 2-78 with illus.

Dornoch. Co. tn. of Sutherlandshire, Scot.; summer resort; Skibo Castle, the Scottish home of Andrew Carnegie, is near; pop. 793.

Dornoch Firth, arm of the North Sea, forming part of coast-line of Ross-shire and Sutherlandshire; 22 m. long, average breadth 5 m.

Dorpat. Tn. of Estonia S.S.R.; pop. 50,000; founded in 1030; member Hanseatic League; famous for univ. founded by Gustavus Adolphus in 1632.

D'Oraay (dōr'sā). Count Alfred (1801-52). Fr. dandy and wit, friend of Byron and Countess of Blessington; long arbiter of literary and artistic London society.

Dorset, Thomas Sackville, 1st Earl of (1530-1608). Eng. statesman and poet, one of leading advisers to Elizabeth I. carried death-warrant to Mary Queen of Scots; part author of *A Mirror for Magistrates*, probably most important work between Chaucer and Spenser; helped write *Gorboduc*, first Eng. tragedy.

Dorset. Co. of Eng.; area 973 sq. m.; pop. 291,157; 3-107; downs, 3-111.

Dorset Horn sheep, 7-22.

Dort, Netherlands. Same as Dordrecht.

Dortmund. Industrial city of W. Ger., in Land of North Rhine-Westphalia; pop. 507,349; 4-1, 6-168.

Dortmund-Ems canal, 2-204.

Dory. Type of fishing boat used off Newfoundland, 3-380.

Dory or John Dory. Sea fish of the *Zeidae* family, found in Mediterranean. English Channel, St. George's Channel; valued for table use.

Dos Passos, John (b. 1896). Amer. author of novels, plays, and essays (*Three Soldiers*; *Manhattan Transfer*).

Dostoevsky, Feodor (1822-81). Russ. novelist, 3-108, 5-47^o, 6-480.

Dotted acolia, sea slug, 6-32 illus. f.

Dotterel. Bird of the plover family, 6-227, migration, 5-204 illus. f.

Dou, Gerard, or Dow (1613-75). Dutch painter, 5-381.

Douai (dōw'ā). Mfg. tn. in N. Fr.; pop. 37,258; Douai version of Bible, 1-443.

Double bass. Musical instrument, 5-307, 308 illus., 7-402.

Double-convex lens, 4-481.

Double entry, in book-keeping, 2-11.

Double Refraction. Property of most crystalline substances whereby a ray of light passing through the crystal is split in two rays which follow different paths at right angles. One is called the ordinary ray and the other the extraordinary ray, 4-501.

Doubles, in lawn tennis, 4-160.

DOWNHAM MARKET

Doublet. A garment worn by men 14th-17th cent. Reached from neck to just below belt.

Doublets. In linguistics; in English, 3-282.

Doubling Castle. Home of Giant Despair in *Pilgrim's Progress*, 2-128.

Dough, in baking, 2-50, 52, 51 illus.

Doughty, Charles Montague (1843-1926). Brit. traveller and writer, 3-291; travels in Arabia, 1-195.

Douglas. A Scottish family famous in history, song, and legend. An encl. of Douglas fell fighting against "Hotspur" Percy at Otterburn (1388). Douglas of Lochleven was Jailer of Mary Queen of Scots (1567-68).

Douglas, Gavin (1174-1522). Scot. poet, 6-511, 3-281.

Douglas, Sir James (1286-1330). "the Black Douglas"; and Bruce, 2-96.

Douglas, Marshal of R.A.F. William Sholto Douglas, Baron (b. 1893). Brit. air force officer; c.-in-c. Fighter Command 1940-42, of Coastal Command 1944-45; c.-in-c. Brit. air forces in Germany 1946-47; chairman B.E.A., 1949.

Douglas. Cap. of Isle of Man; holiday resort; pop. 20,288, 5-110.

Douglas fir, tree, 3-350; in Brit. Columbia, 2-81.

Douglas DC-2 Transport. Amer. mono-plane airliner, 1-41 illus.

Douglas, Sir James (1820-98). Brit. engineer; built the Eddystone Lighthouse that replaced the one constructed by Smeaton.

Doukhobors. *See* Dukhobors.

Doulton, Sir Henry (1820-97). Brit. inventor and manufacturer of pottery; developed pottery works at Lambeth founded by father, John D. Opened works at Burslem in 1847.

Doimer (dōim'ē). Paul (1857-1932). Thirteenth pres. of Fr. Republic, elected 1931; gov.-gen. of Indo-China, 1897-1902; shot dead by half-crazy fanatic in May 1932.

Doumergue (dōm'ērg), Gaston (1863-1937). Fr. politician and lawyer; pres. of the council and minister for foreign affairs (1913-14), and later became foreign minister again; president (1921-31); premier 1934.

Douro. R. of Spain and Portugal, length 185 m.; vineyards, 6-207.

Dow, Gerard. *See* Dou, Gerard.

Dove. Eng. r. in Derby and Stafford, trib. of the Trent; 15 m. long.

Dove Cottage. Grasmere, Westmorland, home of William Wordsworth, 3-289 illus.

Dovedale. Famous Derbyshire beauty spot, associated with Isaac Walton; purchased by National Trust, 2-86 illus., 7-141.

Dover. Spt. of Kent, Eng.; pop. 35,217; 3-109, 2-402, 4-398; break-water, 2-54; castle, 2-257 illus.

Dover, Strait of. Channel connecting North Sea with Eng. Channel and separating Eng. and Fr.; 21 to 27 m. wide; chalk cliffs on both sides.

Dover. Cap. of Delaware, U.S.A.; pop. 8,200; 3-66.

Doves. *See* Pigeons and Doves.

Dove's foot. Plant, 3-524.

Dovey. R. of Wales, rises on E. slope of Aran Mawddwy, Merionethshire, and flows S.W. to Cardigan Bay; length 30 m., 5-175.

Dovre (Dovre), Norway; highest point Snehetta (7,815 ft.), 5-462.

Dowding, Air Chief Marshal Hugh C. T. D., 1st Baron (b. 1882). Brit. air officer; A.O.C.-in-C. Fighter Command 1936-40, covering the Battle of Britain; retired 1942; 2-79.

Dowel. *See* Architectural terms.

Dowlais. Industrial area in S. Wales; Bessemer converter at, 1-438.

Downland, John (1563-1626). Eng. composer of songs to lute accompaniment, which rank among the finest songs ever written. His four books of songs were pub. 1597-1612.

Down. Co. of N. Ire.; 951 sq. m.; pop. 245,106; 3-109.

Down House (at Downe village), Kent; Darwin museum, 3-52; 5-301.

Downham Market. Tn. in Norfolk, Eng.; pop. 2,758; 5-448.

DOWNING

Downing, Sir George (1624-84). Eng. politician; secretary of the treasury under Charles II; Downing St. named after, 3-110.
Downing College, Cambridge University, 2-182.
Downing Street, London, 3-109, 5-23.
Downpatrick, Co. tn. of co. Down, N. Ire.; pop. 3,878, 3-109.
Downs, grassland plain in Australia, 6-187.
Downs, Chalk hills ranges of N. Eng., 3-110; 3-248; in Dorset, 3-107.
Downs, The. Roadstead off Deal, Eng., 3-111.
"Dowser." See **Dowsing**.
Dowsing. Art of divining water, mines, etc. The dowser carries a forked branch or rod, usually of hazel, which is supposed to bend when over underground water etc., 7-427.
Doyen. In diplomatic corps, 1-131.
Doyenne du Comice. Variety of pear, 6-100.
Doyle, Sir Arthur Conan (1859-1930). Brit. novelist, creator of famous detective character, Sherlock Holmes, 3-111; *The Lost World*, 1-312.
D'Oyly Carte company, Gilbert and Sullivan operas, 5-516.
D'Oyly Carte, Richard. See **Carte**.
Drachenfels [drah khenfels]. "Dragon's Rock," mt. in Ger., 1,065 ft. high.
Drachm [dram] or **dram**. A fluid measure and weight (fluid, 1-8th of an ounce; weight 1-16th of an ounce.) See **Pharmacy** (symbols).
Drachna. See **Money** (table).
Draft. A bill of exchange issued by one bank against another; often applied

to all domestic bills of exchange. See **Bill of exchange**.
Draft. Term applied to a party of soldiers dispatched to join a unit or regiment.
Dras, in flying, 1-31.
Draga (Mme. Draga Masin), d. 1903. Queen of King Alexander of Serbia; formerly lady-in-waiting to his mother Queen Natalie; murdered in Belgrade with her husband.
Drag hunting. A method of hunting without a live quarry, 4-210.
Dragon. Fabulous creature, 3-112.
Dragonet. Fish, 3-112.
Dragon-fly, 3-112.
Dragons' teeth. In the Golden Fleece legend, the teeth which were sown to bring forth armed men to fight Jason, 1-226.
Dragon. Variety of pigeon, 6-198.
Dragoons. Originally mounted infantry armed with the dragon, a short musket. Developed into cavalry proper in 18th cent. All Brit. dragoon regiments mechanised after 1935 and form part of Royal Armoured Corps; uniforms, 1-249; standard 2-166.
Drake, Sir Francis (c. 1545-96). Eng. sailor, explorer and privateer, 3-113; and Spanish Armada, 1-240, 2-11 illus., 5-354; and Spanish treasure, 1-131; and Hawkins, 4-142; and Plymouth, 6-229; visit to Oregon, 5-532; Offenburg monument, 4-1.
Drakensberg Mts. S. Africa, 5-325, 7-308, 7-88, 1-64 illus.
Drama, 3-114; Greek, 7-263, 4-93; Sophocles, 7-85; Shakespeare, 7-12; Elizabethan, 3-284; Restoration

drama, 3-286; modern French, 3-456; Passion play at Oberammergau, 3-490; in lt. literature, 4-330. See also **Theatre**.
Dramatic poetry, 6-235.
Drammen, Norway. Spt. at mouth of r. Drammen, on arm of Oslo Fjord; pop. 39,000; exports timber; saw mills, 5-461.
Drammen. R. of Norway, 5-462.
Drambuie. Liqueur made in Scot., chiefly whisky and honey. Recipe said to have been given to the Mackinnon's of Skye by a body guard of Prince Charles Edward as a reward for helping him to escape (1746). Recipe kept as a secret.
Drapers Company, 4-526.
Draughts. A game, 3-122.
Drave [drah've]. R. rising in Trol flows s.e. between Hungary and Yugoslavia, joining Danube after 450 m.
Dravidians. Earliest known inhabitants of India; nothing certain is known of their early history; 4-211.
Drawing, 3-123; anc. Egyptian, 6-135; perspective, 6-135.
Drawing. Process in cotton mill 2-519 illus.
Drayton, Michael (1563-1631). Eng. poet laureate ("Polyolbion"; "Ballad of Agincourt").
Dreamer, The. Name given to a dyke in Netherlands, 6-372.
Dreams, 7-67; and subconscious memory, 5-168.
Drebbel, Cornelius van (1572-1634). Dutchman who invented a submarine in early 17th cent., 7-171.
Dredger, 3-125.

DREDGER

FAMOUS NAMES IN THE HISTORY OF THE DRAMA

GREEK

Aeschylus (525-456 B.C.)—"Prometheus Bound"; "Agamemnon"; "Choephoroi"; "Eumenides".
Aristophanes (c. 445-c. 385 B.C.)—"The Knights"; "The Clouds"; "The Frogs"; "The Birds".
Euripides (480-406 B.C.)—"Alceste"; "Medea"; "Bacchae".
Sophocles (c. 495-405 B.C.)—"Antigone"; "Oedipus Tyrannus".

ROMAN

Plautus (c. 251-184 B.C.)—"Amphitruon"; "Captivi"; "Aulularia" (The Pot of Gold).
Seneca (c. 104-150 B.C.)—"Thyestes"; "Medea".
Terence (c. 194-159 B.C.)—"Andria"; "Hecyra"; "Terentium Menos" (The Self-Tormentor); "Phormio".

BRITISH

Sir James Matthew Barrie (1860-1937)—"Peter Pan"; "Quality Street"; "What Every Woman Knows"; "Dear Brutus"; etc.
Francis Beaumont (1584-1616) and **John Fletcher** (1579-1625)—"Philastr"; "The Maid's Tragedy"; "The Knight of the Burning Pestle".
Arnold Bennett (1867-1931)—"Milestones" (with Edward Knoblock); "The Great Adventure".
James Bridle (O. H. Mavor, 1898-1951)—"Tobias and the Angel"; "The Anatomist"; "Dr. Angelus"; "Daphne Laureola".
William Congreve (1670-1729)—"Love for Love"; "The Way of the World".
Noel Coward (1899)—"The Vortex"; "Private Lives"; "Cavalcade"; "Peace in Our Time"; "Bitter Spirit"; "Relative Values"; etc.
Thomas Dekker (c. 1570-1641)—"The Shoemaker's Holiday"; "Old Fortunatus".
John Drinkwater (1882-1937)—"Abraham Lincoln"; "Oliver Cromwell"; "Mary Stuart".
John Dryden (1671-1700)—"All for Love".
Thomas Stearns Eliot (1888)—"Murder in the Cathedral"; "Family Reunion"; "The Cocktail Party"; "The Confidential Clerk".
St. John Ervine (1883)—"The First Mrs. Fraser"; "Robert's Wife".
George Farquhar (1678-1707)—"The Beaux' Stratagem"; "The Recruiting Officer".
John Galsworthy (1867-1933)—"The Silver Box"; "Strife"; "Justice"; "The Skin Game"; "Loyalties"; "Escape"; etc.
Oliver Goldsmith (1728-74)—"She Stoops to Conquer"; "The Good-Natur'd Man".
Harley Granville-Barker (1877-1946)—"The Voysey Inheritance"; "Waste".
Henry Arthur Jones (1851-1929)—"The Hypocrites"; "The Liars".

Ben Jonson (c. 1573-1637)—"Every Man in his Humour"; "The Alchemist"; "Volpone, or The Fox".

Christopher Marlowe (1564-93)—"Tamburlaine"; "Doctor Faustus"; "The Jew of Malta".

William Somerset Maugham (1874)—"Our Betters"; "The Circle"; "The Breadwinner"; "The Constant Wife"; etc.

Sir Arthur Wing Pinero (1855-1934)—"The Second Mrs. Tanqueray"; "Trelawny of the Wells"; "His House in Order"; etc.

John Boynton Priestley (1894)—"Dangerous Corner"; "Time and the Conways"; "When We Are Married"; "Johnson Over Jordan"; "They Came to a City"; "The Linden Tree"; etc.

Terence Mervyn Rattigan (1911)—"The Winslow Boy"; "The Deep Blue Sea"; etc.

Thomas William Robertson (1829-71)—"Caste"; "David Garrick"; etc.

William Shakespeare (1564-1616)—for full list of plays, see article.

George Bernard Shaw (1856-1950)—"Man and Superman"; "Pygmalion"; "Back to Methuselah"; "Saint Joan"; "The Apple Cart"; etc.

Richard Brinsley Sheridan (1751-1816)—"The Rivals"; "The School for Scandal"; "The Critic".

Robert Cedric Sherriff (1896)—"Journey's End"; "Mrs. Mabel"; "Home at Seven"; "The White Carnation".

Sir John Vanbrugh (1664-1726)—"The Relapse"; "The Provok'd Wife"; "The Confederacy".

John Webster (c. 1580-1625)—"The Duchess of Malfi"; "The White Devil".

Oscar Wilde (1856-1900)—"Lady Windermere's Fan"; "A Woman of No Importance"; "The Ideal Husband"; "The Importance of Being Earnest".

William Wycherley (c. 1640-1713)—"Love in a Wood"; "The Country Wife"; "The Plain Dealer".

IRISH (CELTIC LITERARY REVIVAL)

Sean O'Casey (1880)—"Juno and the Paycock"; "The Plough and the Stars".

John Millington Synge (1871-1909)—"Riders to the Sea"; "The Playboy of the Western World".

William Butler Yeats (1865-1939)—"The Land of Heart's Desire"; "The Hour Glass"; "Deirdre".

AMERICAN

David Belasco (1854-1931)—"The Girl of the Golden West"; "The Return of Peter Grimm".

Marc Connelly (1890)—"Green Pastures".

Bronson Howard (1842-1908)—"The Henrietta"; "Shenanigans"; "The Young Mrs. Winthrop"; "Aristocracy".

William Vaughan Moody (1889-1910)—"The Great Divide".

Clifford Odets (1906)—"Waiting for Lefty"; "Golden Boy"; "Winter Journey".

DREISER

Dreiser, Theodore (1871-1945). American novelist of intense realism; *Sister Carrie* (1900); *Jennie Gerhardt* (1910); *An American Tragedy* (1925), 7-365.
Dreissena. Fresh-water mussel, native to Russia; named after Belg. physician Dreyssen; first found in Eng. in Surrey Docks, London, in 1824, now common in Gt. Brit., Fr., and Belg.
Dresden. Cap. of the Land Saxony, r. Germany; pop. 450,000; 3 126, 4 1 Wagner and, 7 408.
Dresden, Battle of (1813), in Napoleonic Wars, 5 323.
Dresden china, discovery of hard paste process, 6 277.
Dressing, in first aid, 3-365.
Dressmaking, as a career, 2 236.
Dreux [dré]. Old tn. in s.w. Fr.; pop. 10,000; Huguenots defeated by Catholics under Duke of Guise (1562); taken by Germans (1870).
Drew Jane (Mrs. Maxwell Fry). Brit. architect; work at Chandigarh, India, 4-174.
Drey. A squirrel's nest, 7 140.
Dreyer, John Louis (1852-1926). Danish astronomer; catalogue of nebulae, 5 361.
Dreyfus (dräfus), Alfred (1869 1935). Fr. (Jewish) military officer, centre of the famous "Dreyfus case," which convulsed Fr. political life (1894-99). Accused of espionage, he was sent to Devil's Is., 1895. Sentence was quashed, 1898, but he was re-tried by military court and again sentenced, 1899, but pardoned; declared innocent and reinstated in

army in 1906, he won Legion of Honour in 1st World War.
Drift. In geology, debris deposited by ice sheet, 4-228.
Drifter. Type of fishing boat, 3 381, 373 illus.
Drilling, of wells, 1-255.
Drinkwater, John (1882-1937). Brit. poet and playwright; wrote critical studies of William Morris, Swinburne and Pepys. *Abraham Lincoln*; *Oliver Cromwell*, and *Birt in Hand*, were his most successful plays.
Drip. See *Architectural Terms*.
Driscoll, Jem (James) (1880 1925). British boxer. Feather-weight champion 1910, and won Lonsdale belt outright for that weight.
Driver ants, 1 162.
Droeshout, Martin (d. 1640). Eng. engraver of the famous portrait of Shakespeare, frontis. in the 1st Folio edn. of Comedies, Histories & Tragedies printed 1623; 7-13 illus.
Drogheda (drol'da). Port of Louth on r. Boyne, Irish Rep.; pop. 16,773; captured by Cromwell in 1649; taken by William III, 1690, after Battle of the Boyne.
Droitwich. Tn. in Worcestershire, 20 m. s.w. of Birmingham, famous for salt mines and brine baths; pop. 6,543.
Droilleries, in illuminated manuscripts, 5-117.
Drôme. Tributary of r. Rhône rising in the Drôme Alps; 63 m. long, 6 396.
Dromedary. Type of camel, 2 181.
Drones. Fertile male honey-bee, 1-406, 403 illus.

DRYDEN

Druggel. Type of carpet, 2-219.
Drugs, 3 127, 5 521. See also names of individual drugs.
Drugstore beetle, 1-414; and books, 2-12.
Druids. Celtic priests, 3 127, and mistletoe, 5-228, 3 162; oak sacred to, 5 489; Stonehenge, 7 164.
Drum. A percussion instrument, 3-128, 5-308 illus.; African native, 1-58 illus.
Drum Dhu. Highest point (1,554 ft.) of the Mynydd Epynt range, Breconshire, Wales, 2 55.
Drummond light. See *Limelight*.
Drumstick, types used, 3 129.
Drunkenness. State of intoxication; Aztec attitude to, 1-332.
Drupaceous fruits, 3-480.
Drury Lane. Street in w. cent. London running from High Holborn to Aldwych. Present Theatre Royal, opened 1812, on site of 17th-cent. playhouse, since greatly rebuilt. long famous for spectacular drama.
Druses (drö'zez). Religious sect of Syria, numbering between 100,000 and 200,000 persons. Their religion is formed of elements of Mahomedanism, Judaism and Christianity.
Dryad. In Gk. myth., a wood-nymph, 5 488.
Dryasdust. An antiquary invented by Scott as lay figure in various novels. The name, made more famous by *Charlie*, is applied to a proxy writer.
Dry cleaning, 4 155.
Dryden, John (1631 1700). Eng. poet, playwright and critic, 3 129; influence on Eng. prose, 3-287; poet laureate, 6 232, 3 121.

FAMOUS NAMES IN THE HISTORY OF THE DRAMA (contin.)

Eugene O'Neill (1888-1953) — "The Emperor Jones"; "Anna Christie"; "The Hairy Ape"; "Strange Interlude"; "Mourning Becomes Electra."
Elmer Rice (1892 1937) — "The Adding Machine"; "Street Scene"; "Judgment Day."
Robert Emmet Sherwood (1896) — "The Road to Rome"; "Idiot's Delight"; "The Petrified Forest."
Thornton Wilder (1897) — "Our Town"; "The Skin of Our Teeth."
Tennessee Williams (1911) — "A Streetcar Named Desire"; "The Rose Tattoo"; "Summer and Smoke"

FRENCH

Jean Anouilh (1907-) — "Le Bal des Voleurs" (The Thieves' Carnival); "Eurydice" (Point of Departure); "L'Invitation au Chateau" (Ring Round the Moon).
Pierre Augustin Caron de Beaumarchais (1732 99) — "Le Barbier de Séville"; "Le Mariage de Figaro."
Eugène Brieux (1858-1932) — "Les Avariés."
Paul Claudel (1868) — "L'Annonce faite a Marie."
Pierre Corneille (1606-84) — "Le Cid"; "Medee"; "Polyeucte"; "Oedipe"; "Le Menteur."
Maurice Charles Donnay (1859 1915) — "Lysistrata"; "Les Belanaises."
Alexandre Dumas the younger (1821 95) — "La Dame aux Camélias."
Sacha Guitry (1885-) — "Pasteur"; "N'écoutez pas, Mesdames."
Henri René Lenormand (1882-1951) — "Les Ratés"; "In Theatre Street."
Molière (Jean-Baptiste Poquelin, 1622 73) — "Tartuffe"; "L'Avare"; "Le Bourgeois Gentilhomme."
Jean Racine (1639-99) — "Thébaïde"; "Bérénice"; "Phèdre."
Jules Romains (1885-) — "Dr. Knock."
Edmond Rostand (1868 1918) — "Cyrano de Bergerac"; "L'Aiglon"; "Chantecler."
Jean-Paul Sartre (1905-) — "Crime Passionnel."

SPANISH

Pedro Calderón de la Barca (1600 81) — "El Mágico prodigioso"; "La Vida es sueño" (Life's a Dream).
José Echegaray (1833-1916) — "Mariana"; "El gran Galeoto."
Frederico Garcia Lorca (c. 1898-1936) — "Mariana Pineda"; "Bodas de Sangre" (Blood Wedding); "Yerma."
Jacinto Benavente y Martínez (1866-1951) — "La Malquerida" (The Broken Flower); "Princesa Roba."
Serafin and Joaquín Alvarez Quintero (1871-1938 and 1873-1944) — "The Lady from Alcaqueque."
Gregorio Martínez Sierra (1881-1947) — "The Kingdom of God"; "The Road to Happiness."
Lope Felix de Vega Carpio (1562-1635) — "Los Cautivos de Argel"; "El castigo sin venganza."

GERMAN

Johann Wolfgang Goethe (1749 1832) — "Faust"; "Egmont"; "Iphigene auf Tauris."
Gerhart Hauptmann (1862-1946) — "Die Weber" (The Weavers); "Die versunkene Glocke."
Georg Kaiser (1878 1945) — "From Morn to Midnight".
Gotthold Ephraim Lessing (1729 81) — "Minna von Barnhelm"; "Nathan der Weise" (Nathan the Wise).
Johann Christoph Friedrich Schiller (1759 1805) — "Maria Stuart"; "Wallenstein"; "Wilhelm Tell."
Hermann Sudermann (1857-1928) — "Die Ehre"; "Heimat."
Ernst Toller (1893-1939) — "Masse-Mensch."
Frank Wedekind (1861 1918) — "The Dance of Death."

SCANDINAVIAN

Björnsterne Björnson (1832 1910) — "The Gauntlet".
Henrik Ibsen (1828-1906) — "The Pillars of Society"; "A Doll's House"; "Peer Gynt"; "Brand".
Hans Kinck (1865 1926) — "The Cattle Dealer".
August Strindberg (1849-1912) — "Miss Julie"; "The Father"; "To Damascus."

ITALIAN

Vittorio Alfieri (1749-1803) — "Merope"; "Virginia".
Gabriele D'Annunzio (1863 1938) — "La Gioconda"; "Francesca da Rimini"; "La Figlia di Jorio".
Luigi Pirandello (1867-1936) — "Six Characters in Search of an Author"; "Henry IV."

RUSSIAN

Leonid Andreyev (1870-1919) — "King Hunger"; "To the Stars"; "He Who Gets Slapped".
Anton Pavlovitch Chekhov (1860 1904) — "The Sea Gull"; "The Cherry Orchard"; "Uncle Vanya".
Nicolai Gogol (1802-52) — "The Government Inspector".
M. M. Gorki (1868 1936) — "The Lower Depths"; "The Children of the Sun"; "The Barbarians".
Alexander Pushkin (1799-1837) — "Boris Godunov."

BELGIAN

Maurice Maeterlinck (1862-1949) — "Pelléas et Mélisande"; "Monna Vanna"; "L'Oiseau bleu" (The Blue Bird).

CZECHOSLOVAK

Karel Capek (1890-1938) — "R.U.R."; "The Insect Play"; "The Mother."

AUSTRIAN

Arthur Schnitzler (1862-1931) — "Anatol"; "The Lonely Way"; "The Green Cockatoo."

HUNGARIAN

Ferenc Molnár (1878-1952) — "Lilium"; "The Swan"; "The Devil"; "The Guardsman."

DRY DOCKS

Dry docks or Graving docks, 3-98.
Dryden Fawr. Highest point (2,115 ft.) of the Elenth Hills, Breconshire, Wales, 2-55.
Dry ice (solid CO₂). Carbon dioxide, liquefied at pressures above one atmosphere and cooled into a white solid at atmospheric pressure; used as a refrigerant and, dropped by aircraft, to induce rain; also used as an anaesthetic; 2-219.
Dry measure. Brit. standard of capacity measurement for dry grains, pulses, flour. *See* Weights and Measures (table).
Drypoint. Kind of engraving, 3-293.
Dry rot. A form of fungus that attacks timber, 3-489.
Dry walling. Building uncemented walls, as in stone-producing dists. (e.g. Pennines, Cotswolds), as cheap form of boundary for fields. Roughly cut stones are fitted together so that they will lie level and interlock.
Duala. Cap. and chief port, Cameroons, W. Africa; pop. 22,000.
Dual Alliance. Agreement made between Fr. and Rus. (1891) by secret treaty for common action in international matters.
Dual Monarchy. The Hapsburg monarchy of Austria-Hungary, formed from the Austrian empire in 1867, 1-326.
Du Barry, Marie B'ou, Countess (1716-93). Fr. adventuress, favourite of Louis XV.
Dublin. Cap. of Irish Rep.; pop. 521,322; 3-129, 4-284.
Dublin, Irish Rep. Co. bordering Irish Sea; area 342 sq. m.; pop., without city of Dublin (co. tn.), 170,106; chief river, the Liffey; chief port, Dun Laoghaire (Kingstown); mts. in the s.; fisheries, agric., brewing, distilling.
Dublin Bay, Irish Rep. An inlet of the Irish Sea, which penetrates the E. coast as far as Dublin.
Dubois, Ambrose (1513-1614). Fr. portrait painter, 3-439.
Dubois, Paul (1829-1905). Fr. sculptor and painter; his greatest work, in Renaissance spirit, is tomb of Gen. Lamouricre at Nantes; also noteworthy are statues of Joan of Arc at Reims and Montmorency at Chantilly.
Dubrovnik. City in Dalmatia, Yugoslavia; large commerce in medieval times; centre of Serbian culture 15th-17th cents.; pop. 18,800; became part of Yugoslavia after 1st World War; lt. name Ragusa; 7-519, 620 illus.
Ducat. Coin, generally of gold, first minted by dukes of Apulia in 12th cent. The name is derived from Lat. word *ducatus*, meaning ducy, on the coin's inscription. It was worth about 8s.
Duccio (c. 1260-1318). It. painter, member of the Sienese school, 4-317.
Duce, Il (It. the leader). Title assumed by Mussolini, 3-342, 7-484.
Duck. Large group of waterfowl of the order *Anseres*, 3-130; incubation period, 1-460; foot, 3-413 illus.
Duck-Apple Night. Lancashire name for Halloween: apple-bobbing, 4-130.
Duckbill or Platypus. An egg-laying mammal, 3-133; eggs, 3-171 illus., 8-100; foot, 3-413 illus.
Duck decoys, 3-132.
Duckweed. Minute, scale-like freshwater plant, native to all parts of the world. Flat green floating frond, with roots hanging loosely in the water, 7-429.
Ductless glands. *See* Endocrine glands.
Dudavant, Baroness. *See* Sand, George.
Dudley, John. *See* Northumberland, Duke of.
Dudley, Lord Guildford (d. 1544). Husband of Lady Jane Grey, 4-98.
Dudley. City in Worcestershire, 8 m. n.w. of Birmingham in "Black Country"; pop. 62,536; coal and iron mining; makes iron and brass products, 7-476.
Dudley diamond, history of, 3-82.
Duet. In music, composition for two instruments or voices.

Duff, Alexander (1806-78). First Church of Scotland missionary to India; initiated western education in India.
Dufferin and A'va, Frederick Temple Blackwood, 1st Marquess of (1826-1902). Brit. diplomat, gov.-gen. of Canada (1873-78). Viceroy of India (1884-88), and at various times Brit. ambassador to Russia, Turkey, Italy and France.
Du Gard, Roger Martin. French writer. Nobel prize for literature (1937) (*Jean Barrois*; *Les Thibault*).
Dugong. *See* Sea cow.
Dug-out canoe, 1-500 illus.
Duhamel, Georges (b. 1881). French writer of poetry, novels and plays (*The Pasquier Chronicles*), 3-156.
Dulich, Lech. Rose and Crumarty, Scot., 6-455.
Dulburg. Ger. city in N. Rhine-Westphalia, between Ruhr and Rhine with which it is connected by canal; pop. (with Hamborn), 410,783; coal and iron; 4-5, 6-468.
Dukas, Paul (1865-1935). French composer (*L'Apprenti Sorcier*; *Ariane et Barbe Bleue*).
Duke (Lat. *dux*). In Gt. Brit., a nobleman of the highest hereditary rank, except princes of the royal family, 6-106.
Duke of York, H.M.S. Brit. battleship, 5-345 illus.
Duke of York's School, founded at Chelsea, London, by Frederick, Duke of York, second son of George III; transferred to Dover in 1909; the Queen Victoria School near Dunblane, Scot., is a similar establishment.
Dukeries. Dist in Nottinghamshire, covering an area of 100 sq. m. within Sherwood Forest; so called from the ducal estates here; 5-468.
Dukhobors. Russ. pacifist sect, living in Saskatchewan and British Columbia, Canada, 6-500.
Dulac, Edmund (1882-1953). Brit. artist. Illustrated various books incl. *The Arabian Nights*. Also designed stage costumes and décor, and postage stamps.
Dulcimer. Musical instrument resembling a flat box with sounding board and bridges across which wires are stretched, 5-309.
Dulcinea. Character in *Don Quixote*, 2-295.
Dulesinhji, Kumar Shri (b. 1905). Indian cricketer, nephew of Ranjitsinhji. Played for Sussex and England.
Duluth. Town of Minnesota, U.S.A., shipping centre at head of Lake Superior; splendid natural harbour; pop. 101,066, 7-101; iron, steel, flour industries.
Dulwich (duw). Suburb to s.e. of London. D. College, founded by Edward Alleyn in 1606, is one of the important Eng. public schools, 1-113, 5-28; picture gallery, built by Sir John Soane.
Dulwich Park. Area 72 acres; presented to the public by the trustees of Dulwich College in 1890, 5-28.
Duma. National Assembly of Russia, which existed from 1906 to 1917, 6-474, 6-432.
Dumas, Alexandre (1802-70). Fr. novelist and dramatist, 3-133.
Dumas, Alexandre, fils (1824-95). Fr. dramatist, 3-134.
Du Maurier, Daphne (b. 1904). Brit. novelist (Lady Browning), daughter of Sir Gerald du Maurier, whose life, *Gerald*, she wrote; *Rebecca* (1938) and other novels filmed.
Du Maurier, George (1834-98). Brit. illustrator; pictorial satires on society, chiefly published in *Punch*; also novelist (*Peter Ibbotson*; *Trilby*).
Du Maurier, Sir Gerald (1873-1934). Brit. actor-manager, son of George Du Maurier; leading exemplar of school of naturalistic acting. Daphne Du Maurier is his daughter.
Dumbar'ton. Scot. Co. tn. of Dumbartonshire, port at junction of rivers Leven and Clyde; shipbuilding; pop. 23,703; 3-135.

DUNGAREE

Dumbar'ton Oaks, 18th cent. mansion near Washington, U.S.A.; here, on Aug. 21, 1944, representatives of the U.K., U.S.A. and China drew up the draft which formed the basis of the San Francisco conference at which the United Nations organization was founded.
Dumbartonshire. *See* Dumbartonshire.
Dum-dum, India. Tn. in Bengal, 5 m. n.e. of Calcutta; pop. about 30,000; first produced dum-dum bullets (which expand on impact).
Dum-dum fever. *See* Kala-azar.
Dumfries (dunfrīs'), Scot. Co. tn. of Dumfriesshire, on r. Nith. pop. 26,320; burial place of Robert Burns; tweeds, hosiery, cattle-markets, 3-134.
Dumfriesshire. Co. of s. Scot.; pop. 85,656; area 1,072 sq. m.; co. tn. Dumfries, 3-134.
Dum palm. A species of palm with fan-shaped leaves and a stem repeatedly forked, an unusual feature among palms; native to Arabia, Egypt, and Cent. Africa; fruit red skinned with a sweet brown spongy centre used as food.
Dumping. Export of goods to foreign markets at prices below those at which they can be economically produced in those countries.
Duna. *See* Dvina, Western.
Dunant, Jean Henri (1828-1910). Swiss business man who founded the International Red Cross, 6-370.
Dunbar, William (c. 1400-c. 1520). Scottish poet; disciple of Chaucer but with wider humour and greater warmth (*Two Married Women and the Widow*; *The Dance of the Dead*), 6-514, 3-284.
Dunbar, Scot. Spt. in East Lothian on Firth of Forth; pop. 4,115; historic old castle; Cromwell defeated Scots (1650) in battle of, 5-40.
Dunbartonshire. W. co. of Scot., 210 sq. m.; pop. 161,263; co. tn. Dumbarton, 3-134.
Dunblane, Scot. Tn. in Perthshire health resort; the Queen Victoria School for sons of Scottish soldiers and sailors; woollen mills; pop. 2,985; 6-138.
Duncan (d. 1040). Scottish king murdered by Macbeth; a character in Shakespeare's tragedy *Macbeth*.
Duncan, Adam Duncan, Viscount (1731-1801). Brit. admiral; defeated the Dutch off Camperdown in 1797.
Duncan, Isadora (1878-1927). Am. classical dancer, revived and popularised Gk. bare-foot dances with simple, free draperies; wrote very frank memoirs; 3-40.
Duncan, Sir Patrick (1870-1943). Brit. administrator. Gov.-gen. of Union of S. Africa from 1936 to his death.
Duncansby Head, Promontory of (Galloway, Scot., 210 ft. high; John o' Groat's House is 2 m. to the w.).
Dunelm, The (1728). Satirical poem by Alexander Pope, 6-259.
Dundalk (dun'daw'k'), Bay, Irish R. public inlet of the Irish Sea, 7 m. wide at the entrance.
Dundee, John Graham of Claverhouse, Viscount (1646-89). Jacobite rebel "bonny Dundee" to Jacobites and "bloody Claverhouse" to Covenanters.
Dundee. Spt. of Angus Scot.; pop. 177,333; 3-135, 6-510.
Dundrear'y, Lord. Caricature of an Eng. nobleman in Tom Taylor's comedy *Our American Cousin* made famous by Edward A. Sothern character gave names to drooping side-whiskers; at a performance of this play Abraham Lincoln was shot.
Dunedin. Spt. and tn. in S. Island, New Zealand; pop. (1951) 99,300; woollen mfrs., foundries and rolling mills, 5-422.
Dunfermline, Scot., in Fifehire, 16 m. n.w. of Edinburgh; pop. 14,710; famous for damask linen, 3-350.
Dungaree. A coarse Indian calico made from strong fibres. Used in making working clothes; hence worn by dungarees for the overalls worn by engineers, etc.

DUNGINESS

Dungeness (dun-jen's), Kent, Eng. Low marshy promontory on the s. coast, with lighthouse, Lloyd's signalling station, coastguard, etc.; here Admiral Tromp defeated Blake in 1652; 3-247.

Dunkery, Beacon, Ermoor, Somerset, Eng. It is the highest bill on the moor, being 1,707 ft. high and 12 m. in circumference; 7-84.

Dunkirk, Spt. of N. France, pop. 10,575, 3-155, 2-438; refinery, 3-487 illus.

Dunkirk, Evacuation of (1940), 3-136, painting, 3-136 illus. f.

Dunkirk, Treaty of (1947), 3-133.

Dun Laoghaire (dunlōr'), Irish Repub. Spt. and yachting centre in co. Dublin, on s. shore of Dublin Bay, 7 m. s.e. of Dublin; port for steamers to and from Holyhead, formerly Kingstown; pop. 49,963; 4-281.

Dunlin, shore bird; egg, 1-452 illus. f.

Dunlin, The Gap of, Killybegs, Ireland, 4-281 illus.

Dunlop, John Boyd (1840-1921), Scot. veterinary surgeon and inventor of the pneumatic tyre, 3-16, 6-466.

Dunmore Head, Headland on coast of co. Kerry, Irish Republic; most westerly pt. of Ireland.

Dunmow Fitch. A fitch of bacon offered to any married couple who "will go to the priory (at Little Dunmow, Essex), and kneeling on two sharp-pointed stones, will swear that they have not quarrelled nor repented of their marriage within a year and a day after its celebration." Inst. 1214. Competition held at Dunmow annually on Whit. Monday; similar ones at West Wickham, Kent, and other places.

Dunne, Finlay Peter (1867-1936), Amer. humorous writer (*Mr. Dooley*), 7-366.

Dunne, John William (1875-1919), Brit. inventor and thinker. Invented aeroplane called after him. Pub. writings on the meaning and nature of time; *In Experiment with Time* (1927); *The Serial Universe* (1934).

Dunnet Head, Northernmost point of Gt. Brit., 2-165.

Dunoon, Tn. in Argyllshire, Scot.; has fisheries; pop. 12,360.

Dun Rigg, Mt. in Selkirkshire, Scot., 2-113 ft., 6-531.

Duns, Co. tn. of Berwickshire, Scot., pop. 2,028; 1-437.

Dunstable, Edward Plunkett, 18th Baron (b. 1878), Irish story-writer and dramatist; fantastic and imaginative work (*The Gods of Pegana*; *The Gods of the Mountain*).

Duns Scotus, John (c. 1265-1308), Scottish theologian and philosopher, one of the greatest of the Schoolmen; as destructive a critic as Thomas Aquinas was constructive; his followers became bigoted opponents of the New Learning; so the name of the learned "Subtle Doctor" came to mean a "dunce"; 6-160.

Dunstable, Tn. of Bedfordshire; former centre of straw plaiting; industries now include engineering, printing, rubber manufacture, and plastic products; gliding centre; pop. 17,108; 1-404 with illus.

Dunstan, St. (A.D. 924-988), Abbot of Elestonbury, Archbishop of Canterbury and adviser to Kings Edmund I and Edgar of England; first of a long line of Eng. ecclesiastical statesmen.

Dunster, Lionel Charles (1865-1946), Brit. soldier. Original of hero of Kipling's *Stalky and Co.*; in 1st World War led a Brit. force across Persia to Baku in attempt to save oil wells from Bolsheviks and Turks, 1918.

Dunwich (dun'ij), Vill. in Suffolk; has suffered much from sea encroachments. From Anglo-Saxon times until the Middle Ages a prosperous port with many churches and monasteries, 7-152.

Duodecimo (12 mo), size of book, 2-4.

Duodenum, The first portion of the small intestine between the stomach and the jejunum, enclosing the pancreas, 3-89, 90 with diag.

Dupin, A. L. A. See Sand, George.

Dupleix (dōpleks'), Joseph François, Marquis (1697-1763), Greatest Fr. gov. in India; failure as empire-builder due to lack of support by Fr. govt. against his Brit. rival Clive and Brit. East India Co.; recalled to France (1754), died in obscurity and want.

Du Pont de Nemours (dō pawn de nemōr'), Pierre Samuel (1739-1817), Fr. statesman and economist; imprisoned and property confiscated in Fr. Rev.; emigrated to U.S.A. His son, Eleuthère Irénée (1771-1834), established the famous Du Pont chemical and explosive works.

Duquesne (dōkən'), Abraham, Marquis (1610-88), Fr. admiral; gained two notable victories over the Dutch fleet in 1676.

Duralumin, Alloy of aluminium, copper, manganese & magnesium, iron, and silicon 5.81, 1-115.

Durance, Tributary of r. Rhône rising in Fr. Alps; 220 m. long, 6-396.

Durango (dōran'gō), Mexico. State in N. centre; 42,272 sq. m., pop. 483,800; cap. Durango (33,400).

Durani, ruling tribe of Afghanistan, 1-46.

Durazzo or **Durres**, Chief spt. and old cap. of Albania; pop. 12,000; exports fruit, timber and agricultural produce.

D'Urban, Sir Benjamin (1777-1849), Gov. of Cape Province, 1831-38; gave name to Durban, 3-138.

Durban, Chief spt. in prov. of Natal, S. Africa; pop. 463,000; 3-137, 1-50, 51, 6-325.

Durbār, (Anglicised form of Hindi *darbar*). Term applied to great state levee; at Delhi, 4-254, 253 illus.

Düren, Tn. of W. Ger. in the Land of North Rhine-Westphalia, 20 m. n. of Aachen; iron, chemical and textile industries; pop. 37,200.

Dürer, Albrecht (1471-1528), Ger. artist and engraver, 3-136, 6-34; compared with Holbein, 4-186; drawing by, 3-124 illus.; house at Nuremberg, 5-476 illus.

Durham, John George Lambton, 1st Earl of (1792-1840), Brit. gov. gen. of Canada (1838); his "Report on the Affairs of British North America" outlined scheme which later resulted in present Dominion of Canada; helped to draft the Reform Bill of 1832; 2-200, 2-83.

Durham, Maritime co. of N.J., Eng.; area 1,015 sq. m.; pop. 1,463,116; co. tn. Durham, 3-139.

Durham, City and co. tn. of Durham or r. Wear, pop. 19,283; 3-139, 3-219; castle interior, 2-261 illus.; cathedral, 2-271 illus.

Durham cattle. A short-horned breed noted for beef quality.

Durham University. Consists of two parts, one at Durham and the other at Newcastle-upon-Tyne; foundation, 3-139; Codrington College, Barbados, and Fourah Bay College, Sierra Leone, are affiliated to it.

Durian, Tall forest tree growing in India and Malaya, resembling the elm; spherical fruit 6 to 8 inches in diameter; seeds, about the size of chestnuts, are roasted and eaten; 5-93.

Durovernum, Rom. tn. See Canterbury.

Durra, Grain of Indian millet. See also Sorghum.

Durrës (Albania). See Durazzo.

Duse (dōzā), Eleonora (1859-1924), Italian actress; emotional power gained her international fame; influenced by Arrigo Boito; intimate friend of d'Annunzio, many of whose plays were written for her; also acted in plays by Dumas, Ibsen, Sudermann.

Düsseldorf (dō'seldorf), Cap. city and inland port in W. Ger. in Land of North Rhine-Westphalia; pop. 420,909; industries, 4-5.

Dust; behaviour as an aerosol, 2-465.

Dutch doll or **Flanders baby**, 3-104.

Dutch East India Company, and Cape

DYTISCU

of Good Hope, 1-51; and Henry Hudson, 1-136; and S. Africa, 2-34.

Dutch East Indies. General name for the former Dutch possessions in the East Indies. See Indonesia.

Dutch Guiana or **Surinam**, N. Amer.; area 55,140 sq. m., pop. 221,000; cap. Paramaribo; 4-102.

Dutch language, and **Afrikaans**, 1-66.

Dutch (or **Tower**) **Mill**, type of windmill, 7-459, 460 illus.

Dutch School of painting, 5-382, 6-34.

Dutch Wars. Three naval and commercial wars fought between Eng. and the United Provinces (Netherlands) in 1652-54, 1665-67, 1672-74; 2-308.

Dutch West India Company. Established 1621 with monopoly of trade on Amer. and African coasts; first settlement on Manhattan, 5-416.

Dutch West Indies. See **Netherlands Antilles**.

Du Toit, Stephanus Jacobus, South African writer, 1-66.

Duval, Claude (1643-70), Eng. highwayman, daring and polite; hanged at Tyburn; 4-176 illus.

Duveen, Joseph Duveen, 1st Baron (1869-1939), Brit. benefactor to art; endowed galleries at the Tate and National Galleries.

Dvina (dvōneh'), Northern. R. in N. Russia, formed by Sukhona and Jug; flows 780 m. n.w. into White Sea; 3-308.

Dvina, Western, or **Duna**, R. of Russia, flowing s.w. from Valdai plateau then n.w. across White Russia, S.S.R. and Latvia, S.S.R. to Gulf of Riga, 9 m. below Riga; 610 m. long. Connected with Black Sea and Baltic by Berezhnaya canal.

Dvinsk. See **Daugavpils**.

Dvorak (dvōr zhahk'), Antonin (1811-1904), Bohemian musical composer (*New World* symphony, Humoresques, Slavonic Dances).

Dwarf, 3-140.

Dyaks (dī'ahs), People of Borneo, 2-18; Sir James Brooke and, 6-199.

Dyce, William (1806-64), Scot. painter of religious subjects; frescoes in Houses of Parliament.

Dyes, 3-141; colour absorption, 2-463; for silk, 7-51; for viscose, acetate and nylon, 6-369; synthetic indigo, 4-256; Tyrian purple, 6-161; dyeing oriental carpets, 2-248.

Dying Gaul or **Gladiator**, Gk. sculpture, 4-91.

Dykes or **dikes**. Earth embankments used to protect low lands from flooding by sea or rivers; in Netherlands, 5-372.

Dykhtau, Mt. in Caucasus mts. (17,054 ft.), 2-271.

Dynamite. High explosive consisting of nitroglycerine absorbed in some porous substance such as kieselguhr (a form of clay). Used for blasting. Invented by Alfred Nobel, 1866; 3-329.

Dynamo. Power-driven machine that converts mechanical energy into electrical energy by the movement of conductors in a magnetic field. The term is more correctly confined to a machine producing direct current, 3-142, 3-212 with diag.; at Battersea power stn., 3-217.

Dyne. The unit of force based on the centimetre-gram-second system. It is that force which, acting on a mass of one gram, gives to it an acceleration of one centimetre per second per second, 3-142.

Dysentery. Intestinal disease accompanied by fever and loss of blood; amoebic form caused by protozoa.

Dyson, Sir Frank (1868-1939), Brit. astronomer; Astronomer Royal, Scot. (1905-10); Astronomer Royal (1910-33).



Dyson, Will (1880-1938), Australian cartoonist. Worked on *Daily Herald*, London, 1913-25, 1931-38; 1-321.


Dyspepsia. See **Indigestion**.

Dysprosium (Dy). Rare earth chem. element; atomic no. 66; atomic weight 162.46; 2-224.

Dytiscus (zool. family). See **Water beetles**.

E

OF all the letters in the English alphabet E is the most used; yet the Egyptians and the Phoenicians did not have it in their alphabets. Its ancestor, however, was the Egyptian , which was simply the sign of a breathing. When later it was written  it looked like our E turned down. The Phoenicians called it *he* (pronounced *ha*), meaning "window," which seems a

good name for a breathing sound, and it has a fairly recognizable likeness to a window in form. The Phoenicians and Hebrews changed the form of it still further, turning the stem up. But they wrote from right to left, and so they faced it towards the left like this . The Greeks, who wrote from left to right just as we do, turned it round. They were the first people to use it as a vowel

Eadwig (Saxon king). See **Edwy**.

Eagle. Bird of prey. 3-145, 1-157 illus.; eye, 3-333 illus.; foot, 3-413 illus.

Eagle, in golf, 4-46.

Eagle, in heraldry, 4-185.

Eagle owl (*Bubo bubo bubo*), largest of the owls, 6-11.

Eagre. See **Bore**.

Ealing. Hor. of Middlesex, part of Greater London; pop. 187,306; 5-27, 5-200.

Ear, 3-147; and ultrasounds, 7-343.

Ear, of wheat, 7-148, 417 illus.

Earhart, Amelia (1898-1937) (Mrs. Putnam). Amer. airwoman, called Lady Lindy from facial likeness to Charles Lindbergh; flew Atlantic solo in 1932; crossed N. Pacific in 1935; lost in mid-Pacific on last lap of a round-the-world flight.

Earl. In (H. Brit. a title and rank of nobility, third in the order of peerage, 6-106.

Earl's Court, London, Eng. Site of exhibitions held 1884-1914; new stadium for exhibitions, sporting events, etc., opened in 1937.

Early English. Architectural style (1189-1307), 1-211.

Earn, r. of Perthshire, Scot.; issues from Loch Earn, flows 46 m. to Tay.

Earn, Loch, Perthshire, Scot.; length 64 m., width 1 m.; max. depth, 287 ft.; noted for trout and salmon fishing; 6-138.

Earnest money. Part of the purchase price, paid by buyer to seller, for the purpose of binding the contract.

Earrings. Article of jewelry; origin of use, 4-372.

Earth. Planet on which we live, 3-149; age of, 3-516; Biblical creation story, 1-15; in solar system, 1-278, diag., 1-282; in atmosphere, 5-180; bacteria and formation of crust, 4-344, 7-127; climatic changes, 3-516; curvature of the earth, 1-279 illus.; gravitational pull, 4-68 illus.; rotation of and gyroscope, 4-113; as giant magnet, 5-83; and moon, 5-256; oceans, 5-194; seasons, 6-526. See also **Astronomy**; **Geography**; **Geology**.

Earth. In electrical engineering, the property of the mass of the earth to conduct a current; or, the use of the earth as a conductor of electricity. In electrical communication, a telegraphic circuit using one transmission wire, the return current passing through the earth.

Earth, burrow of a fox, 3-426.

Earthware. Name for all pottery that is not translucent, including faience, delft, stoneware. It may be glazed or unglazed. Terra-cotta is unglazed earthware of red or yellow clay.

Earth-nuts. See **Groundnuts**.

Earthquakes, 3-152; Assam, 1-276; in Japan, 4-342; floods caused by; and volcanoes, 7-405. See also **Earthquakes** (table).

Earthworm, 3-153, 1-157 illus.

Earwig. An insect, 3-154, 4-268.

East, Sir Alfred (1819-1913). Brit. painter and etcher; landscapes; R.A. in 1913.

East Africa. Part of Africa including Brit. E. Africa (Kenya, Uganda, Tanganyika Territory, and the isls. of Zanzibar and Pemba); Brit. and Fr. Somaliland; Eritrea and Mozam-

bique; racial problems, 1-52; groundnut scheme, 4-99.

East Anglia. Early kingdom in E. of Anglo-Saxon Britain, comprising present counties of Norfolk and Suffolk, 3-111.

East Bengal. Prov. of Pakistan. Area 51,100 sq. m.; pop. 42,119,000; cap. Dacca, pop. 220,000; 1-129.

Eastbourne. Seaside resort of Sussex, England; many schools, incl. Eastbourne College; close by is Beachy Head; pop. 57,800.

NOTABLE EARTHQUAKES

1755. *Lisbon, Portugal*. Sea wave produced by quake destroyed the city with loss of about 40,000 lives.

1797. *Ecuador*. Quito and other towns destroyed; 40,000 killed.

1891. *Mino and Ovari, Japan*. Killed, 7,270; injured, 17,393. wholly destroyed 197,000 houses.

1906. *San Francisco, California*. Violent quakes, accompanied by surface movements ranging up to 23 feet, followed by fire; about 700 killed.

1908. *Calabria and Sicily*. About 76,000 persons killed, 95,000 injured; most of Messina destroyed.

1917. *Guatemala*. Repeated earthquakes over a week killed about 2,500.

1920. *Kansu Province, China*. Violent quakes ranging over 300 square miles; 200,000 lives lost.

1923. *Tokyo and Yokohama, Japan*. One of the severest quakes in history; nearly 160,000 killed.

1931. *North Island, New Zealand*. Destruction along 45 miles of coast. Napier harbour level rose 18 feet.

1935. *Quetta, India*. Towns of Quetta, Kalat, and Mastung destroyed, including outposts; 30,000 dead.

1939. *Chile*. Disastrous quake overwhelmed Concepcion, Chillan, and other towns. Over 20,000 killed.

Turkey. Vast area in Anatolia devastated; 25,000 killed, 8,000 injured and 20,000 houses destroyed.

1942. *Ecuador*. Guayaquil devastated.

1943. *Turkey*. 25 m. railway wrecked, 4,000 killed.

1944. *Argentina*. San Juan destroyed in 40 secs. Over 2,000 killed.

1947. *Japan*. 60,000 sq. m. damage. 50 places destroyed. Over 1,250 killed.

1948. *Fukui, Japan*. Town destroyed. About 5,500 dead.

1949. *Ecuador*. 5 tns. and many villas in area between Cumborazo and Cotoapaca destroyed. About 10,000 killed.

1950. *India*. 30,000 sq. m. devastated, chiefly in Assam. About 1,500,000 homeless; over 1,000 killed.

1951. *Salvador*. Several towns destroyed or severely damaged. Over 1,000 dead.

1953. *Ionian Islands*. Eighty per cent. of buildings of Cephalonia, Zante, and Ithaca destroyed; 400 killed and 85,000 homeless of pop. of nearly 93,000.

East Chicago. Tn. in Indiana, U.S.A., pop. 51,124; steel-works, 4-255.

East Dereham. Tn. in Norfolk, Eng. pop. 6,411; 5-118.

East End, district of London east of Aldgate Pump.

Easter. Christian Church festival, 3-154.

Easter Island. In S. Pacific Ocean; 50 sq. m.; belongs to Chile, 3-155; ancient civilization on, 6-25; giant carved stone figures, 2-359.

Easter lily, used as church decoration 4-506.

Eastern Empire. See **Byzantine Empire**.

Eastern Ghats. Low range of mts. along Coromandel coast of India; average height under 1,000 ft., 4-210.

Eastern Orthodox Church. See **Greek Orthodox Church**.

Eastern Question in European politics, the complicated problems arising out of European interference in the affairs of Turkey and the Balkan states formerly under Turkish rule; 7-335.

Eastern Rumelia. Balkan prov., joined Bulgaria (1885), 2-120.

East Ham. Bor. of Essex and suburb of London, Eng.; dist. for large working-class pop., many dock workers; engineering, soap and other works; pop. 120,873; 5-27.

East India Company. An English company founded for the purpose of trading with India and the E. Indies. Received its original charter from Queen Elizabeth I in 1600; the growth of the company was the real foundation of Brit. dominion in India; 3-232, 1-134, 4-252, 2-84.

Warren Hastings and development of, 4-136; Clive and, 2-111; trading post at Rangoon, 6-363; and Bengal, 1-128; Boston Tea Party, 1-137.

rule in India abolished, 4-253; ships, 7-36 illus.; transfer of power to the Crown (1858), 7-350.

East Indies, Netherlands. See **Indonesia**.

Eastlake, Sir Charles Lock (1793-1865). Brit. artist; R.A., 1829; as first director of Nat. Gallery, 1855, did much to procure many of the finest works now owned by the Gallery.

Eastleigh. Tn. in Hants, Eng. Has locomotive works, cable and aircraft factories; pop. 30,557; 4-123.

East London, S. Africa. Important port on E. coast of Cape of Good Hope; extensive harbour, obstructed by bar at low water; pop. 90,110.

East Lothian. Co. of Scot., formerly Haddingtonshire, area, 267 sq. m. pop. 52,240; co. tn. is Haddington, 5-39.

Eastman, George (1854-1932). Amer. pioneer in photography; inventor of the Kodak and roll film, 3-389, 6-170.

East Prussia. Until 1945 easternmost prov. of Prussia, on Baltic, separated from rest of country by Polish Corridor; cap. was Königsberg (now Kaliningrad). Divided between Poland and R.S.F.S.R. in 1945, 1-131.

East Punjab (India). See **Punjab**.

East Riding. One of the three administrative divisions (O.E. *Riding*, a third part of Yorks, Eng.; co. tn. is Beverley).

East River, New York. Length 16 m. width from 1,000 yds. to 3 m. crossed by six bridges, 5-419 illus.

Eau de Cologne. Scented toilet water 3-156.

EAU-DE-VIE

Eau-de-vie (Fr. water of life). Old Fr. name for brandy.

Eaves, in architecture. That part of the edge of a roof which projects beyond the face of the wall.

E'bal, Mt., in Palestine, opposite Mt. Gerizim, 3,077 ft. high.

Ebbw Vale, Tn. in Monmouthshire; pop. 29,295; coal-mining centre; (plate) works, iron and steel foundries; 5-245.

Ebenezer [ebēnēzēr] ("stone of help"). Place in Judaea where Samuel with divine assistance defeated Philistines (1 Sam. vii. 10-12).

Eberlein [ä'bärlin], Gustav (1847-1926). Ger. sculptor.

Ebers [ä'bäiz], Georg Moritz (1837-98). Ger. Egyptologist and novelist (*In Egyptian Princess*, *Uarda*).

Ebert [ä'bärt], Friedrich (1871-1925). (Ger. statesman, formerly a saddler, became leader of the Social Democratic party; was elected first pres. of Ger. Republic (1919).

E-boat, Eng. name for Ger. and Ital. motor-torpedo boats used in the Second World War.

Ebonite. See **Vulcanite**.

Ebony. A hard, black wood, 3 156.

Eboracum, Rom. name for York, Eng.

Ebro, r. of N.E. Spain; flows s.e. to 465 m. from Cantabrian Mts. to Mediterranean.

Ecbatana, Persia. Anc. cap. of Media; modern Hamadan, 6-132.

Eccentric. In engineering, a metal disc mounted eccentrically on a shaft (that is, the shaft does not pass through the centre of the disc's diameter) to give rectrocrating (up and down) motion to a valve, pump, or lever. Sometimes called a cam.

In internal combustion engine, 4 271.

Ecclesiast [eklēsiāst]. Vll. in Scot., 14 m. E. of Dumfries; pop. 988.

Eccles, Sir David (b. 1901). Brit. Cons. politician; min. of works, 1951-54; min. of education from 1954; on Conservatism, 2 487.

Eccles, Tn. in Lancashire, 1 m. W. of Manchester; cotton and textile industries. Eccles cakes are famous; pop. 11,927.

Ecclesiastes [eklēziāstēs] ("the preacher"). A book of the Old Testament attributed by Jewish tradition to Solomon.

Ecclesiasticus. Book of Bible Apocrypha.

Echegaray [ächägäri]. José (1833-1916). Span. mathematician, statesman, and dramatist; sharer of Nobel prize in 1904; 7 122.

Echeverria, Esteban (1805-51). Argentinian writer, 7-101.

Echidna [ekidnā]. "Spiny anteater" of Australia, an egg-laying mammal.

Echinodermata. A group of marine animals, 1-155; starfish and sea-urchins, 7-150.

Echo. Nympth in Gk. myth., 3-156.

Echo, in sound, 3 156.

Echo-sounding, navigation by, 5-341; on fishing boats, 3-381; research in oceanography, 5-198.

Eckermann, Johann Peter (1792-1851). Ger. writer, friend and literary executor of Goethe (*Conversations with Goethe*).

Eckhardt [ek'häht] or **Eckhart**, "the Faithful". Old man in Ger. legend who warned of the evils that would attend those who followed Frau Holle or Holda (Venus); companion of Tannhäuser.

Eclipse [iklipsis], in astronomy, 3-156, 6-381, 7-188 illus.

Ecliptic. Apparent orbit of sun; precession of equinoxes, 3-295.

Ecolgue. Form of pastoral poem in dialogue form, relating the lives and loves of shepherds, e.g. Virgil's *Eclogues*, 7-402; Spenser's *Shepherd's Calendar*.

Ecology. The study of living organisms in their natural surroundings, 3-158, 1-450; plant associations, 2-25.

Economics. The study of the production, distribution, and consumption of wealth, 3-159; banks and banking, 1-363; Communism, 2-474; co-operative societies, 2-499; cus-

toms and excise, 3-12; fairs, 3-336; foreign exchange, 3-418; gold standard, 4-13; guilds, 4-103; Hanseatic league, 4-128; Industrial Revolution, 4-239; money, 5 233; slavery and serfdom, 7-65; socialism, 7-81; stocks and shares, 7-158; taxation, 7-230.

Eoru silk. Variety of silk, 7-54.

Ecuador. Rep. of S. America; area 175,830 sq. m.; pop. 3,321,000; cap. Quito; 3-160; flag, 3 385 illus. f.; exports, 7-96; Galapagos Isls., 3-498.

Edale. Village in Derbyshire, Eng.; Pennines, 6-119 illus.

Edam [ä'däm], Netherlands. Tn. in N. Holland; pop. 8,200; makes ships, rope, leather, cheese, 2 315.

Eddington, Sir Arthur Stanley (1882-1944). Brit. astronomer and philosopher; noted for research on motions of stars, gravity, and relativity.

Eddy, Mary Baker (1821-1910). Amer. religious leader, founder of Christian Science; her teaching is set out in *Science and Health* (1875). She founded the *Christian Science Monitor* newspaper in 1908, and organized The Church of Christ Scientist at Boston in 1879; 3-461.

Eddystone Lighthouse. Built on a reef 14 m. s.w. of Plymouth, Devon. Fourth and present lighthouse on site was completed in 1882, and is 168 ft. above water level; 2-289, 4 light, 4-502.

Ede, James Chuter (b. 1882). Brit. Labour politician. Home secretary 1945-51.

Ede, Tn. in Nigeria, W. Africa; pop. 51,000.

Edelweiss [ä'delweis]. White flower of aster family, found in Alps; now rare, except in inaccessible places.

Eden, Sir (Robert) Anthony (b. 1897). Brit. politician, 3-162. Created K.C., Oct. 1954; prime minister 1953.

Eden, r., flows to Solway Firth; salmon stream; 65 m. long; 3-107.

Eden, r. of Surrey, Enck, 7 196.

Eden, Garden of. The earthly paradise of the Bible, 1-15.

Edentata. Order of toothless mammals, 5 103.

Ederle, Gertrude (b. 1908). American swimmer; swam English Channel, 1926, in 14 hrs. 34 mins.; 7-210.

Edessa [edēsa]. Anc. city in Assyria; became great centre of early Christianity and learning; modern city Urfa (pop. 31,000).

Edfu [edfū], Eg. Anc. tn. on Nile, 54 m. s.e. of Thebes; Temple of Horus (3rd cent. B.C.), most perfectly existing Eg. temple.

Edgar (911-75) King of Eng.; called "the Peaceful." Fought against Welsh and built a fleet for service against pirates. His chief adviser was Dunstan, archbisp. of Canterbury.

Edgehill. Ridge 12 m. s. of Warwick, 826 ft. high; in 1642 scene of first battle of Civil War, 7-420.

Edgeworth, Maria (1767-1849). Irish-Eng. novelist whose Irish stories (*Castle Rackrent*, etc.) influenced Thackeray and Turgenev; her *Balintra* introduced the natural heroine, who did not faint and blush constantly; 2-356.

Edgware, Tn. of Mdx., Eng., part of bor. of Hendon, 9 m. N.W. of Marble Arch, London. Once a village, now a dormitory suburb of London.

Edict of Nantes (1598) Decree granting religious freedom to Fr. Huguenots, issued by Henry IV of France, 4-164; revoked by Louis XIV (1685), 4-202.

Edict of Worms (1521). Decree condemning Luther as heretic; issued by Emperor Charles V, 5-53.

Edinburgh, Philip, Duke of. See **Philip, Duke of Edinburgh**.

Edinburgh [ed'indbrā]. Cap. of Scotland; pop. 466,770; 3-162; castle and Princes St., 3-163 illus.

Edinburgh, University of, at Edinburgh, Scot.; founded 1583; arts, medicine, law, theology, music, science.

Edinburghshire. Former name of Midlothian, Scot., 5-39.

EDWARDES

Edirne. Turkish name for Adrianople.

Edison, Thomas Alva (1847-1931). Amer. inventor, 3 164; and the kinetoscope, 2 389; incandescent electric lamp, 3 220; first phonograph, 4 36 illus.

Edition binding, book-binding by machine, 2 9.

Edmonton. Cap. of Alberta prov., Canada; pop. 159,631; 3 165, 2 195.

Edmonton, Eng. Bor. in Middlesex; trade in timber; pop. 101,244.

Edmund (841-870). Eng. saint, king of East Anglia from 855. Captured by Danes during their invasion of 870 and beheaded; shrine at Bury St. Edmunds, 2-133.

Edmund (c. 922-46). Saxon king of Eng., grandson of Alfred the Great and son of Edward the Elder; warred with the Danes, conquered Cumberland.

Edmund Ironside (c. 981-1016). Saxon king of Eng., son of Ethelred "the Unready"; as ruler of Mercia, he led Saxon armies against Canute, who defeated him, drove his army back into Northumberland, and compelled division of Eng.; named "Ironside" for extraordinary strength and courage, 2 215.

Edom. Inhabited country s. of Palestine, later called Idumaea; Edomites, enemies of Israelites, 4 375.

Edred (d. A.D. 955). Saxon king of Eng., subdued Danes in Northumberland; guided chiefly by his intimate friend St. Dunstan.

Education, 3 166; academics, 1 9; agricultural teaching in Gt. Brit., 1-79; and careers, 2 223; of the deaf, 3-56; educational psychology, 6 301; films and, 2 401; Froebel's theories, 3 171; of girls, 2 336; intelligence tests, 4 271, 272; Montessori method, 5 259; in music, 5 306 illus.; of Negroes, 5 362; physical education, 6 183; school, 6 503; in Scotland, 6 513; teaching as a career, 2 240; in Tibet, 7-274 illus.

Education Act of 1870, 6 501.

Education Act of 1902, 6 501.

Education Act of 1911, 6 501.

Edward I (b. 1239; ruled 1272-1307). King of Eng., 3 166; and Coronation chair, 2 509; Crusades, 3 2; and Parliament, 3 277, 4 86 illus.; and Simon de Montfort, 5 252; and Scotland, 6 512, 7-116; Eleanor crosses, 2 535; Welsh border castles, 2 261; development of Hull, 4 202.

Edward II (b. 1284; ruled 1307-27). King of Eng., 3 167; at Bannockburn, 1 365, 6 512; at battle of Burton Bridge, 2 133.

Edward III (b. 1312; ruled 1327-77). King of Eng., 3 167; claim to Fr. throne, 4 203, 6 155; capture of Calais (1347), 2 166; and the burghers of Calais, 3 168 illus.; and Order of the Garter, 3 520; battle of Crécy, 2 527.

Edward IV (b. 1412; ruled 1461-83). King of Eng., 3 167; and Wars of the Roses, 6-454; musical band, 5-526.

Edward V (b. 1470; ruled 1483). King of Eng., 3-167; and Richard III, 6 400; murder of, 6-454; in the Tower, 3 168 illus.

Edward VI (b. 1537; ruled 1547-53). King of Eng., 3 167, 4 161; prayer book, 6-280; with his councillors, 3-168 illus.

Edward VII (b. 1841; reigned 1901-10). King of Gt. Brit., 3-169, 7 396 with illus.; Derby wins, 3-76.

Edward VIII (b. 1894; acceded and abdicated 1936). King of Gt. Brit., later Duke of Windsor, 3-169.

Edward the Confessor (ruled 1042-66). King of Eng., 3-166, 3-276; and Westminster Abbey, 5-19.

Edward the Elder (ruled 901-24). Saxon king of Eng., son of Alfred the Great, 3-166.

Edward the Martyr (ruled 975-78). Saxon king of Eng., 3-166.

Edward, the Black Prince. See **Black Prince**.

Edwardes, George (1852-1915). Brit. theatrical manager; director at the

EDWARD OF WOODSTOCK

Gaiety, London, for nearly 30 years, producing a series of famous musical plays.

Edward of Woodstock. See **Black Prince**, The.

Edwards, John Pasmore (1823-1911). Brit. journalist and philanthropist; proprietor of the *Echo*, a former London evening newspaper; devoted large sums of money to hospitals, art galleries and libraries.

Edwards, Jonathan (d. 1758). Famous Amor. preacher-writer, author of *The Freedom of the Will*, 7-383.

Edwards, Sir Owen (1858-1920). Influence on Welsh literature, 7-115.

Ed'wy or Edwig (c. 940-959). Saxon king, eldest son of Edmund I; succeeded his uncle in 955; shared throne with brother Edgar.

Eel. Elongated snake-like fish, 3-170; instinctive behaviour, 1-152; migration, 5-202.

Efferent nerves, in human body; work of, 5-368.

Eft. See **Newt**.

Egan, Pierce (1772-1849). "Father of Brit. sporting journalism"; wrote on races, prize-fights, cock-fights, cricket matches, executions, etc.; *Pierce Egan's Book of Sports and Manners of Life*; *Life in London*.

Egbert (d. 839). King of Wessex; conquered Northumbria and Mercia; called "first king of the English"; 2-75; and St. Swithin, 6-488.

Egede, Hans (1686-1758). Norweg. missionary; in Greenland, 1-221.

Egeria (Sj'eria). In Rom. myth., a nymph who inspired Numa Pompilius, 4-429.

Egg, 3-172; coloration of bird's egg, 1-458, 459; incubation of birds' eggs, 1-460; embryo of chicken, 3-239 illus.; protein in white of egg, 6-297; of fish, 3-377, frog, 3-472; of ostrich, 6-8 with illus.; of skates and rays, 7-59; of raven, 6-367; robin, 6-410 illus.; and Enster, 3-154.

Egg plant or Aubergine. Annual plant, native to Asia. Leaves oval, lobed, woolly on underside. Flowers similar to those of the tomato. Egg-shaped fruit, 6 to 8 in. long, purplish colour, is edible.

Eggshell razor. A mollusc, 5-232 illus. f.

Egham. Tn. in Surrey, Eng.; pop. 24,513; here is Royal Holloway Coll. (London Univ.) for Women.

Eglantine. See **Sweet Briar**.

Egmont, Lamoral, Count of (1522-68). Flemish hero, gov. of Flanders and Artois under Philip II of Spain; his unjust execution for treason by Council of Blood gave impetus to the Netherlands revolt; theme of Goethe's *Egmont*.

Egmont, Mount. Peak on N. Island, New Zealand (8,260 ft.), 6-122.

Egots or Epicureans. A school of philosophers, 6-150.

Egremont. Urban district and town of Cumberland, Eng., on r. Ehen, 5 m. s. of Whitehaven. Iron ore is mined. Sellafield atomic energy establishment is on coast near by. Pop. 6,000. Also a n.w. suburb of Birkenhead, Cheshire, 4-525.

Egret. Bird of the heron family, 7-168.

Egypt. *Egypt*, *Egyptus*. Moth, 2-132 illus.

Egypt, Ancient, 3-183; type of people, 3-198 illus.; agriculture, 1-71; armies, 1-245 with illus.; iron blades used, 4-293; navy, 5-350; ships, 7-28; Gk. astronomers, 1-278; fishing, 3-378; geometry, 3-517; tanning leather, 4-466; medicine, 5-161; status of cats, 2-263; status of wives, 5-135; costume, 2-420, 2-14 illus.; ceremonial false beards, 1-397 with illus.; animal worship and deities, 3-199; burial customs, 3-183, 184, 193 illus.; symbol of the cross, 2-535; dolls in tombs, 3-104; Isis, 4-301; mummies, 2-88, 5-295; Ostris, 6-6. *Architecture, Painting, Sculpture*: architecture, 1-209; embroidery, 3-237; furniture, 3-490; glass-making, 4-30; hieroglyphics, 4-174; music, 6-303; painting and drawing, 3-194, 195, 199 illus., 6-33; papyrus as writing material, 6-82; sculpture, 6-520, 5-89 illus., 3-184,

186-88, 190, 191, 195, 198; temples, 3-185-189 illus.; art in tombs, 3-193; Rosetta Stone, 6-454; writing, 1-190 illus., 7-45; weights and measures, 7-435.

History: Old Kingdom, 3-196; Middle Kingdom, 3-198; New Kingdom, 3-197; as a Rom. province, 1-53; rule in Judea, 4-375; occupation of Jerusalem, 4-382.

Egypt, Modern. Country of Africa; area 386,000 sq. m.; pop. 19,000,000; cap. Cairo, 3-172; map, 3-174; flag, 3-385 illus. f.; racial type, 3-182; cotton-growing, 2-516; education, 3-192; Arab conquest and later, 3-175; Napoleon's campaign and administration, 5-318, 319; protectorate and independence, 1-55; claims to the Sudan, 7-180.

Egyptian Pound. See **Money** (table).

Egyptology. Science of archaeology of Egypt, 1-203, 2-183; Brit. Museum collections, 2-88.

Ehrenbreitstein (Ärenbr'it'shtin). Ger. Tn. across the Rhine from Coblenz; fortress on rock 400 ft. high, taken by Fr. (1799), restored to Ger. by Congress of Vienna (1815).

Ehrenburg, Ilya G. (b. 1891). Russ. writer; war correspondent in both World Wars; many stories and novels; *The Fall of Paris* won 1942 Stalin prize for lit., 6-481.

Ehrlich (Är'likh), Paul (1854-1915). Ger. bacteriologist, discovered drug "Salvarsan", 3-137; Nobel prize winner (1908).

Elchendorf (I'khendorf'), Joseph, Baron von (1788-1857). Ger. poet and story-writer; notable for romantic lyrics, 4-13.

Elder, type of duck, 3-131, 132 illus.

Eifel (I'fel), The. Barren plateau of Germany, about 1,000 sq. m.; average elevation 1,500 to 2,000 ft.

Eiffel (I'fel), Alexandre Gustave (1832-1923). Fr. engineer, builder of Eiffel Tower.

Eiffel Tower, Paris, 6-84, 6-79 illus.

Elger (I'ger). Peak (13,042 ft.) in Bernese Oberland, Swiss Alps.

Elgs. Isl. of the Inner Hebrides, Inverness-shire, Scot.; area 12 sq. m.; pop. 150; 4-275.

Eight, Piece of. Old Span. silver coin, the piastre; so called because it was divided into eight silver reals. In use during 17th and 18th cents.

Eights Week, at Oxford Univ., 6-459.

Elkon Basilike (I'kon basil'iké) (the kindly image). Famous book which appeared after Charles I's execution, and professed to be the King's own account of his sufferings in prison, probably written by Bishop John Gaude (1605-62).

Elkonoklastes (image breaker). Milton's defence of the execution of Charles I, written to counteract *Elkon Basilike*; at the Restoration it was ordered to be suppressed and burned by the hangman.

El, Loch. Sea loch, Inverness-shire, Scot., 4-275.

Elinaudi (Änow'dé), Luigi (b. 1874). It. economist and second pres. of It. republic; opposed Abyssinian war; in exile 1935-41; in 1947 app. vice-premier and min. of finance, president May 1948.

Elindhoven. Tn. in Netherlands; pop. 140,554; rly. junct. and industrial centre; radio and electrical factories; 5-370; and Arnhem battle, 1-253.

Einhard (Inahart) (c. 770-840). Secretary, biographer and son-in-law of Charlemagne, 2-306.

Einsiedeln (Inz'edeln), Switzerland. Tn. 20 m. s.e. of Zürich; famous pilgrim resort; Benedictine abbey; reputed birthplace of Paracelsus.

Einstein, Albert (1879-1955). American scientist, 3-208; relativity, 6-360, 3-301; space curvature, 7-149; mathematics, 5-149.

Eire. See **Irish Republic**.

Eisenach (Izenakh). Summer resort in cent. Ger. at n.w. end of Thuringian Forest; pop. 43,385.

Eisenhower, Dwight David (b. 1890). Allied C.-in-C. 1943-45; President of U.S.A., 3-206, 7-363.

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Eisenstein, Sergei (b. 1898). Russ. pioneer film director, 3-396.

Eisleben (I'laben). Ger. tn. in Saxony, 20 m. n.w. of Halle; pop. 25,000; in Russ. zone after 2nd World War.

Elser, Kurt (1867-1919). Bavarian Socialist politician; Pres. of revolut. gov't, 1918.

Elstadded. Welsh festival, 3-207, 7-413.

Ejector parachute, used in jet fighter aircraft, 6-75 with illus.

Ekatereburg. See **Sverdlovsk**.

Ekatereinoslav. See **Dniepropetrovsk**.

Ekon. Anc. Philistine city in Palestine, 6-157.

Elaine (elän'). In Arthurian legend the maid of Astolat who pines and dies for love of Sir Lancelot.

Elam (S'lam). Bible name for ancient Persian prov. of Susiana.

Elan, r. of Wales, 15 m. long. Rises on e. border of Cardiganshire and flows s.e. to join the Wye; Elan Valley reservoirs, 6-353.

Eland. Species of antelope, 1-171, 1-67 illus. f.

Elasmobranchii (elasmobran'kii). Subclass of cartilaginous fishes; includes sharks.

Elates, Mt., Greece. See **Cithaeron**.

El-Azariyeh. See **Bethany**.

El Azhar. Mosque and university, Cairo, Egypt; centre of Muslim learning, 3-182.

Elba. It. Isl. off w. coast; 140 sq. m., pop. 26,200; Napoleon exiled to 5-323.

Elbe, r. 725 m. long from source in Czechoslovakia to mouth at Cuxhaven, 3-207, 1-503, 4-1.

Elberfeld (Ger.). See **Wuppertal**.

Elbing, Poland. Spt. in former Prussia, 5 m. from the sea on r. Elbing; shipbuilding, iron and tin work; textile mfrs.; pop. 72,000. Ceded to Poland from Germany in 1915 and given Polish name of Elbląg.

Elblag, Poland. See **Elbing**.

Elbruz, Mt., Caucasus, U.S.S.R., highest peak in Europe; 18,467 ft., 2-271, 3-308.

Elburz Mts. Range south of Caspian Sea, highest peak Mt. Demavend (14,500 ft.), 6-133 illus.

Elchingen (el'khingen). Vbl. in Bavaria on Danube, 75 m. n.w. of Munich, victory of French under Ney over Austrians (1805).

Elder. Flowering tree, 3-207; elderberries, 3-207 illus.

Elder Brethren. Trinity House officials, 7-318.

El Dorado (eldorah'dó). Mythical region abounding in gold and precious stones, believed by Span. explorers to be somewhere in Amer. expeditions in search of, 2-46. Raleigh's search for, 6-362.

Eleanor of Aquitaine (c. 1122-1204). Queen of Louis VII of France divorced, then married Henry II of Eng.; mother of Richard I, 5-40, 4-162.

Eleanor of Castile (d. 1290). Queen of Edward I of England, with whom she journeyed on a Crusade. Eleanor crosses, 2-535.

Election, 3-208. See also **Ballot**; **Vote**.

Electors. In Holy Rom. empire, Ger. princes with rights of choosing the emperor, 4-188; Charles IV - Golden Bull and, 4-8.

Electra. In Gk. myth., daughter of Agamemnon and Clytemnestra saved life of her brother Orestes who killed his mother, his father's murderer; subject of opera (1909) by Richard Strauss.

Electrical apparatus, alloys in, 1-116.

Electrical engineering, as a career, 2-236.

Electrical recording, 4-58.

Electric clock, 2-417, 5-278.

Electric cooker, 2-496 illus.

Electric eel, 3-377.

Electric fire, heating properties, 4-140.

Electricity, 3-210; in aluminium extraction, 1-128; and amber, 1-131; battery, 1-356; copper in electrical apparatus, 2-504; Edison's electric lamp, 3-165; Faraday's work on 3-341; frequency control and piezo

ELECTRICAL TERMS IN COMMON USE

These and many other terms used in electrical work, will be found dealt with in greater detail under their own heads throughout the Fact-Index.

Accumulator (or storage battery). A secondary cell that stores current in the form of chemical energy.

Alternating Current (A.C.). An electric current in which the direction of flow changes or alternates.

Ammeter. Instrument for measuring current in amperes.

Ampere (A). The practical unit of current energy.

Anode. The electrode or point through which a current enters a cell, gas discharge tube, or thermionic valve.

Arc. Luminous discharge of current.

Armature. That part of an electrical machine which carries the winding connected to the external supply and in which the principal e.m.f. is induced.

Battery. Two or more primary or secondary cells electrically connected and used as a single unit.

Brush. Conductor arranged to make electrical contact between a stationary and a moving surface.

Capacitance (C). The property of a body to hold a charge of electricity.

Capacitor, or **Condenser**. Conducting plates separated by a dielectric (g.v.).

Cathode. The electrode or point through which a direct current leaves a liquid or gas; as in a cell or thermionic valve.

Cell. Source of electrical energy produced by chemical reaction between two dissimilar metals (or between a metal and carbon) both separately in contact with an electrolyte.

Charge. The quantity of electricity on a body, e.g., the plates of a capacitor. Also the amount of electricity in a storage battery.

Circuit. A number of conductors connected together to carry a current.

Circuit-Breaker. A switching device for interrupting or restoring the passage of an electric current through a circuit. Its simplest form is the electric light switch. An example of a protective circuit-breaker is the fuse in a domestic lighting system.

Coil. A wire conductor in the form of a coil or spiral. It produces electromagnetic effects, and is the basis of the transformer.

Conductor. Material that offers low resistance to an electric current.

Converter. Machine for converting D.C. into A.C. current or vice versa.

Commutator. Assembly of copper bars each connected to a coil of an armature (g.v.) winding but insulated from each other. The commutator rotates with the armature, and brushes sliding on the surface of the commutator bars collect current from the windings.

Coulomb (C). The unit of quantity of electricity. It is the amount of electricity carried by a current of one ampere flowing for one second.

Current (I). The passage of electricity through a body by virtue of a drift of negatively-charged electrons through it.

Cycle. In an alternating electric current there is both reversal and rise and fall of the current and voltage values. One complete series of these events is termed a cycle and can occur many times per second.

Dielectric. Substance which offers relatively high resistance to the passage of an electric current.

Direct Current (D.C.). Current which flows in one direction only.

Discharge. Energy taken from a charged storage battery, or from a circuit through which current is passing.

Discharge Tube. Any device provided with electrodes and in which an electric discharge takes place in a vacuum if sufficiently high voltage is applied to the electrodes.

Dynamo. Power-driven machine that converts mechanical energy into electrical energy.

Electrolysis. Production of chemical change of a compound in solution by passing through it an electric current.

Electrolyte. A conducting medium or solution through which an electric current flows by virtue of chemical changes or decomposition.

Electromagnet. A piece of iron or steel which is magnetised when a current is passed through a coil surrounding it.

Electromotive Force (e.m.f.). Force that tends to cause a movement of electric current in a circuit. The practical unit of e.m.f. is the volt, and its symbol is E.

Electronics. Science that deals with the activity and control of electrons and their practical application.

Electrophoresis. The movement of matter in solution under the influence of an electric current.

Electrostatics. Electricity at rest, as electric charges, fields, etc.; as distinct from electricity in motion, current.

Farad (F). Practical unit of electrostatic capacitance. That capacitance which, when charged to a potential of one volt, carries a charge of one coulomb.

Field. That space in the neighbourhood of a charged body, or of a varying magnetic field, throughout which an electric charge would experience a mechanical force.

Frequency (f). The number of cycles which an A.C. current completes per second.

Fuse. Safety device on electrical machines and wiring systems.

Galvanometer. Instrument for detecting small electric currents.

Gauss. The C.G.S. electromagnetic unit of flux density or magnetic induction.

Generator. Machine such as an alternator or dynamo used for converting mechanical energy into electrical energy.

Gilbert. The C.G.S. unit of magnetomotive force.

Grid. An electrode in an electronic valve whose primary function is to control the flow of current between two other electrodes.

Henry (H). The practical unit of self or mutual inductance.

Hydro-electric Power. Current obtained by converting the energy of flowing water into electrical energy.

Insulator. Material that offers relatively high resistance to the passage of an electric current.

Jar. Unit of capacitance formerly used in the British Navy.

Joule (J). The M.K.S. unit of work or energy. It is the work done in one second by a current of one ampere flowing through a resistance of one ohm.

Kilowatt (kW). Unit of electrical power equal to one thousand watts.

Kilowatt-Hour (kWh). British Board of Trade unit of electrical work. It is the work done when a rate of work of 1,000 watts (electrical) is maintained for one hour.

Lenz's Law. States that the direction of a current induced in a circuit as a result of a change in the interlinkings between the circuit and a magnetic field is such as to oppose the motion which produces it.

Magnet. A mass of iron or other material having the property of attracting or repelling other masses of iron.

Magnetic Field. Space in the neighbourhood of an electric current, or of a permanent magnet, throughout which the forces due to the current or magnet can be detected.

Magnetism. Property of iron, steel, nickel, and a few other metals of attracting or repelling other magnets.

Maxwell. The C.G.S. unit of electromagnetic flux.

Mega or Meg (M). Prefix signifying one million times, chiefly used in electrical work, e.g. megacycle, one million cycles; megavolt, one million volts; megawatt, one million watts; megohm, one million ohms.

Mho. Name sometimes used for the practical unit of electrical conductance.

Negative (-). One of two points between which an electric current exists.

Oersted. The centimetre-gram-second unit of magnetising or magnetic force.

Ohm (Ω). Practical unit of resistance.

Parallel. Two or more conductors so connected that when current flows in the circuit it is divided between them.

Period (T). The time during which an alternating current passes once through its complete cycle of values.

Photo-Electric Cell. Electronic device the electrical properties of which undergo change when exposed to light.

Poles. Those points on a magnet where the lines of force converge. The positive and negative terminals of a cell.

Positive (+). One of two points between which there is passage of an electric current. Opposite of negative.

Potential Difference (V). A difference in the electrical states existing at two points, and which causes a current to flow between them.

Reactance (X). The characteristic of the impedance (resistance) to the flow of an A.C. current in a circuit.

Rectifier. Device for converting an alternating current into a direct current.

Relay. Any piece of apparatus in which small electric power is used to control greater electric power.

Resistance (R). The property of a substance whereby it resists the passage of electricity. It is measured in ohms.

Resistor. A piece of apparatus placed in a circuit to resist current flow.

Rheostat. A resistor which can be altered to vary the amount of resistance a circuit offers to the passage of an electric current.

Series. Two or more circuits or cells connected in such a way that the same current flows through all of them.

Short Circuit. Condition created when the terminals of a generator, cell, battery, or other source or conveyor of electrical energy are needlessly connected by a conducting path of low resistance.

Solenoid. A coil of wire wound in the form of a cylinder so that its length is large compared with its radius. When D.C. is passed through the wire the solenoid behaves like a bar magnet.

Transformer. Device for converting electrical energy received at one voltage to electrical energy sent out at a different voltage.

Volt (V). Practical unit of electromotive force or pressure. It is that electromotive force which, applied steadily to a conductor the resistance of which is one ohm produces a current of one ampere.

Voltaic Cell. Source of electrical energy depending on chemical action and complete in itself, as in cells or storage batteries.

Voltmeter. Instrument for measuring the value of an electrical pressure between two points.

Watt (W). Practical unit of electric power. It is the amount of energy expended per second by an unvarying current of one ampere at a pressure of one volt.

Watt-Hour (Wh). The unit of electrical energy. It is the amount of work done by one watt acting for one hour.

Wave. In electricity, the graphic form of an electrical disturbance induced along a conductor. Its maximum velocity is equal to that of light (186,282 miles a second). In radio, a disturbance propagated through free space and having the nature of a travelling magnetic field accompanied by an electric field at right angles to it.

Wavelength. The distance between two similar and successive points on an alternating current wave. In radio, the distance, measured radially from the source, between two successive points in free space at which an electromagnetic wave has the same phase.

Weber. The practical unit of magnetic flux.

ELECTRICITY METERS

electricity, 6-196; as lightning, 4-504, 505; and magnetism, 5-84, 85; radiation, 6-339; radio, 6-341, 7-376-377 with illus.; silver as conductor, 7-56; submarine cable transmission, 2-152; transformer, 7-307 with illus.; generated by water power, 4-217; power from Niagara Falls, 5-429. *See also* Electrical Terms (II 6).

Electricity meters, how they work, 5-183 with illus.

Electric light and power, 3-217; methods of producing electricity, 3-214, 215; dynamos for generation, 3-142; lamps, 4-142; meters, 5-183; with illus.; neon lighting, 5-366; platinum in light bulbs, 6-222; fire fighting and electrical installations, 3-362; turbines and water-power, 7-330 illus. f.

Electric locomotive, 5-14.

Electric micro-second flash tube. Type of lamp used in photography, 4-444.

Electric motor. *See* Motor, electric.

Electric railways, 6-356.

Electric ray or torpedo fish, 7-294, 7-59.

Electric traction, and underground railways, 7-345.

Electro-cardiograph. Instrument for testing the medical condition of the heart.

Electrocution, or killing by electric shock, a form of capital punishment practised in parts of the U.S.A. First adopted in New York state, 1888.

Electrode. Conductor by means of which a current passes into or out of a liquid or gas, e.g., the electrode of a cell or storage battery; of a discharge tube, or of an electric furnace, 1-386.

Electrodynamics. Science that deals with electricity in motion, e.g., electric currents, as distinct from electrostatics, e.g., the charge of electricity on the plates of a capacitor. Ampère (q.v.) laid the fundamental laws governing the theory of electrodynamics, 3-210.

Electrolysis. Production of chemical change of a compound in solution by passing through it an electric current. The conduction of electricity through the solution is accompanied by an actual transfer of matter, as shown by chemical changes at the electrodes, 3-220; in electroplating, 3-225.

Electrolyte. A conducting medium or solution through which an electric current flows by virtue of chemical changes or decomposition and the consequent movement and discharge of ions, 1-386; in aluminium extraction, 1-128.

Electromagnet. A piece of iron or steel which is magnetised when an electric current is passed through a coil surrounding it. The iron or steel core then behaves as a magnet, 3-215; in dynamos, 3-143; salvaging metal, 4-289 illus.; and ultrasonics, 7-344.

Electromagnetic induction, 3-211; Faraday and, 6-311.

Electromagnetic rays. *See* Ultra-violet Rays.

Electromagnetic waves, 3-221, 6-340 illus. f.; electromagnetic theory of light and ether, 3-301; Faraday's experiments, 7-307; Maxwell's work on, 5-150.

Electromotive Force (e.m.f.). Force that tends to cause a movement of electric current in a circuit; the chemical (cell) or mechanical (generator) condition for producing electromagnetic energy by the transfer of electricity (current) in a certain direction. The practical unit of e.m.f. is the volt, and its symbol is E; of cell, 1-386; of generator, 3-142.

Electron. An elementary particle containing the smallest negative electric charge. It is the movement of electrons in a conductor that constitute an electric current. Although normally existing within an atomic system, electrons may be

isolated from matter, as in cathode rays, 3-221, 3-212; and television, 7-252; in electronic devices, 3-222; and valency, 2-318; and spectra, 7-128; behaviour in chemical reaction, 1-11; and radio, 6-340 illus. f.; 7-376; in X-ray tubes, 7-507.

Electron gun, and television, 7-252.

Electronic calculating machines, 2-170 with illus.

Electronic devices, 3-221; in radar, 6-338. *See also* Photo-electric Devices.

Electronics. Field of physical science that deals with the activity and control of electrons; also the practical application of electron emission by cathode ray tubes and thermionic valves as in radio, television, radar, and counting and computing devices.

Electron microscope, 5-197, 196 illus., 3-221.

Electrophoresis. The movement of colloidal particles (matter in solution) under the influence of an electric current.

Electroplating. Coating with metal by electrolysis, 3-223, 7-523; silver used in, 7-56.

Electroscope. Instrument for detecting presence of electricity, 3-216.

Electrostatics. Phenomena exhibited by electricity at rest, as electric charges, electric fields, electric induction in conductors, etc., as distinct from electricity in motion, as electric currents, electromagnetisation, etc., 3-210, 214.

Electrotyping. In printing, the process of producing copper facsimiles of type and illustrations. A wax mould is taken of the original material, dusted with graphite (to increase electrical conductivity) and suspended in a solution of sulphate of copper. An electric current through the solution causes a copper shell to be formed on the mould. This shell is removed from the mould and a strengthening backing of molten type-metal added; the completed plate is approx $\frac{1}{8}$ in. thick.

Electrovalence. A chemical bond in which an electron is transferred from one atom to another, the resulting ions being held together by electrostatic attraction. Formation (chemical theory of atom), 2-314 with diag.; and dissociation of molecules, 4-278.

Electrum. An alloy of gold and silver, 1-114; used by Greeks for jewelry, 4-372.

Elegiac poetry, 6-235.

Elementary schools, 6-504.

Elements, 3-225; in history of chemistry, 2-316; periodic table, 3-224; Davy's work on, 3-51; true gases in, 3-510; Mendeléeff's Periodic Table, 5-169; isotopes and, 4-301; radio-activity, 6-351; in order of increasing weight, 1-297.

Elenith Hills, Wales, 6-353.

Elephant, 3-225, 1-61 illus.; African, 1-65; foot, 3-413 illus.; hair, 5-100; howdahs on, 7-45 illus. f.; ivory from, 4-331; teeth, 5-102; sacred white elephants, 7-46.

Elephant's Isle. Small isl. between Bombay and mainland of India; interesting for Hindu religious sculpture; named from colossal statue of elephant found there.

Elephant beetle, found in W. Indies, 1-112.

Elephantiasis [elefant'as'is], or "elephant skin" disease in which parts of body swell enormously and skin becomes discoloured and hardened.

Elephantine [elefant'ine]. Eg. Small isl. in the Nile opposite Assuan (Syrene); anc. monuments and nilometer (water-gauge).

Elephant's ear. *See* Begonia.

Eleusinia. In anc. Greece, festival of goddess Demeter and Persephone, 3-69, 1-288.

Eleusis [el'us'is]. Anc. city in Attica, Greece, on coast opposite isl. of Salamis; in early times a powerful rival of Athens; Eleusinian mysteries, 1-288, 8-69.

Elevation. *See* Architectural Terms.

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Elevator, in aeroplane, 1-38, 39 diag.

Elevator. Name used in U.S.A. for a passenger lift, 4-493.

Elgar, Sir Edward William (1857-1934). Eng. composer, 3-227, 6-306.

Elgin, James Bruce, 8th Earl of (1811-63). Eldest son of 7th earl; gov. of Jamaica (1812-46); gov.-gen. of Canada (1846-54); viceroy of India 1860 to his death.

Elgin, Thomas Bruce, 7th Earl of (1766-1841). Brit. diplomat and art collector, envoy to Belgium, Prussia, and Turkey. Brought Elgin marbles (great sculptures from the Parthenon and elsewhere) to London in 1806 - now in Brit. Museum, 3-228, 229.

Elgin, Victor Alexander Bruce, 9th Earl of (1849-1917). Brit. statesman; viceroy of India 1894-90.

Elgin. Co. tn. of Morayshire, Scot.; pop. 10,535; history, 5-261.

Elgin Marbles, 3-228, 5-121, 2-88.

El Greco. *See* Greco, El.

El'li. Hebrew priest and judge, under whose care Samuel was brought up (1 Samuel).

Elia [el'ia]. Pen-name of Charles Lamb, 4-141.

El'jah. Hebrew prophet; denounced Ahab, king of Israel, for idolatry, destroyed the 450 prophets of Baal, was carried to heaven in a chariot of fire (1 Kings xvii; 2 Kings ii).

Eliot, Charles William (1831-1926). Amer. univ. teacher; pres. of Harvard Univ., U.S.A., 4-131.

Eliot, George (1819-80). Pen name of Mary Ann Evans, Brit. novelist, 3-229; M.S. of, 3-290 illus.

Eliot, Sir John (1592-1632). Eng. statesman. Parl. leader with Pym and Hampden against Charles I.'s encroachments; promulgated theory of a responsible ministry; imprisoned for 2 years and died in Tower of London.

Eliot, Thomas Stearns (b. 1888). Anglo-Amer. poet and dramatist; naturalised Brit. subject (1927); awarded O.M. and Nobel Prize for literature in 1948; made his name with *The Waste Land* (1922); other works incl. *Murder in the Cathedral* (1935), 3-122 illus.; *The Family Reunion* (1939); *Four Quartets* (1944); *The Cocktail Party* (1949); *The Confidential Clerk* (1953), 3-291.

Ellis. Important city of anc. Greece on r. Pelopon.; here all candidates for Olympic games trained for a month.

El'isha. Hebrew prophet, on whom fell the "mantle of El'jah," his master and predecessor in struggle against Baal worship (1 Kings xix; 2 Kings xiii).

Elissa. *See* Dido.

Elixir of Life, in alchemy, 1-95.

Elizabeth, St. (1207-31). Hungarian princess; according to legend bread she carried for the poor, seized by her husband, was turned to roses.

Elizabeth (1837-98). Austrian empress, wife of Francis Joseph, assassinated at Geneva by an anarchist.

Elizabeth (b. 1876). Queen of Albert I of Belgium, former princess of Bavaria.

Elizabeth (1596-1662). Queen of Frederick of Bohemia, and daughter of James I of England, ancestress through her daughter, the Electress Sophia, of Hanoverian and Windsor sovereigns of England.

Elizabeth I (1533-1603). Queen of Eng., 3-230; and Drake, 3-114 and England's sea power, 3-277 at Kenilworth, 4-398; and Mary Queen of Scots, 5-142; and Raleigh 6-362; Reformed Church, 2-381 riding boot, 2-14 illus.; the Royal Shawms (band of musicians) 6-309, handwriting of, 7-503 illus.

Elizabeth II (b. 1926). Queen of Gt. Brit., N. Ireland, and of her other realms and territories, head of the Commonwealth, 3-233, 1-frontis, visit to Canada, 2-184, 2-204; coronation, 5-333 illus. f.; coronation, 2-509, 511 illus., 3-235 illus.; and Gt. Guides, 4-24; opening Parliament, 6-80 illus.; Philip, Duke of Edinburgh, 6-154; titles of children, 6-463

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Elizabeth (1465-1503). Daughter of Edward IV and queen of Henry VII of Eng.

Elizabeth (Queen Mother) (b. 1900). B ft. queen, consort of George VI, 3-236, 6-450 illus.; ancestry, 3-523.

Elizabeth. Queen of Carol I of Rumania. *See* Carmen Sylva.

Elizabeth (1709-62). Empress of Russia; daughter of Peter the Great and Catherine I; seized throne (1741); sided against Prussia in Seven Years War; only her timely death saved Frederick the Great from military disaster.

Elizabeth Marie Hélène (1764-94), commonly called "Madame Elizabeth," sister of Louis XVI of Fr., executed by revolutionary tribunal.

Elk. Largest member of the deer family; the Amer. variety is known as moose, 5-260, 3-60, 5-464.

Elkhound, Norwegian. *See* Dogs (list).

Ell. Medieval European measure of length, now disused. Varied in different countries. The Eng. ell was 45 ins., the Scottish 37 ins., and the Flemish 27 ins.

Ellenborough, Edward Law, Earl of (1790-1871). Brit. administrator; gov. gen. of India; annexed Sind.

Ellenborough, Edward Law, 1st Baron (1750-1813). Brit. judge; chief counsel for Warren Hastings; became lord chief justice.

Ellerman, Sir John Reeves (1862-1933). British shipowner; left fortune of nearly £37,000,000.

Ellesmere. Lake in Shropshire, Eng., 7-14.

Ellesmere Island. N.W. of Greenland, almost covered by ice caps; explored by Brit. expedition in 1931-35.

Ellice (el is) or Lagoon Islands. Group of small coral is., in Gilbert and Ellice Islands colony, belonging to Gt. Brit., in Pacific, N. of Fiji Is.; 11 sq. mi.; pop. 1,613; 6-28.

Elliotson, John (1791-1868). Brit. physician, one of the first to urge clinical lectures in teaching medicine; physician to both Dickens and Thackeray; *Punch* is dedicated to him.

Elliott, General (Brit. soldier). *See* Heathfield, Lord.

Elliptical tough-shell. A mollusc, 5-232 illus. f.

Ellis Island. Small is. in New York Bay, used from 1892 to 1954 as U.S.A. immigrant station 5-113.

Elora. Tn. in Hyderabad, India; rock monasteries, 2-281.

Ellsworth, Lincoln (1880-1931). Amer. explorer; flight across Antarctic, 6-217.

Elm. Deciduous tree, 3-236; cork buttresses in, 2-505; chromosomes, 2-25; 7-314 illus.

El'man, Mischa (b. 1891). Rus. violinist and composer (*Humoresque*).

Elmira. City of New York state, U.S.A., on the Chemung r. Its coll. for women (1855) was first U.S. coll. to give women degrees comparable with those of men. Pop. 49,716.

Elohim (elohim). God of the Hebrews.

El Paso (elpah'so). Texas, U.S.A. Rly. centre and main distributing point for s.w. U.S., and main gateway between U.S. and Mexico; important smelting industry; pop. 130,185; 7-260.

Elsinore (el si-nor') (Danish Helsingør). Denmark, spt. on N.E. coast of is. of Zealand; pop. 15,000; shipbuilding, commerce; scene of Shakespeare's *Hamlet*.

Elster or White Elster. R. of Cent. Ger., emptying into Saale 3 m. S. of Halle; 115 m.

Elstree. Tn. of Herts; pop. 3,460; a centre of British film industry 4-173.

Elswick. Suburb of Newcastle-upon-Tyne, Eng.; shipbuilding and armament manufacture.

Elver. A young eel; life cycle, 3-170 with diag.

Ely. Mkt. tn. and cath. city of Cambs, Eng.; pop. 9,989. 3-237, 2-182

cathedral, 3-252, 2-270 illus.; Here ward the Wake's defence, 4-169.

Ely, Isle of, England; an administrative co.; pop. 89,038; 2-182.

Elyot, Sir Thomas (c. 1480-1546). Eng. diplomat and scholar; friend of Sir Thomas More; remembered for his books *The Castle of Health*, and *The Book Named the Governor*.

Elvium (el'vium), or Elysian Fields. In Gk. myth., a place to which the souls of the good depart at death; sometimes identified with *Fortunate Isles (q.v.)*.

Elytra. Wing covers of beetles and other insects; they usually cover the back of the insect, and the hind wings are folded under them; of lady bird, 4-436.

Elzevir (el'zev'er). Family of Dutch 17th-cent. printers famous for beautiful types and choice grade of paper; Louis (1540-1617) began printing in 1583, his five sons carried on the work.

Emanation (Em). *See* Radon.

Emancipation Proclamation. Abolishing slavery in U.S.A. (Sept. 22, 1862).

Emanuel I, the Happy (1169-1521). King of Portugal, in whose reign, called "Portugal's golden age," Vasco da Gama opened sea route to India, Cabral took possession of Brazil, and Albuquerque established Port. rule in the E. Indies.

Embalming. Egypt. Mummies, 5-29.

Embankment, The. London thoroughfare, incl. (on the left bank of the Thames) the Victoria Embankment (from Westminster bridge to Blackfriars bridge) Grosvenor Rd., and the Chelsea Embankment; on the right bank, between Westminster Bridge and Vauxhall, is the Albert Embankment; and, between Westminster and Waterloo bridges, is Son in Bank.

Embankment, a form of dam, 3-30.

Embassy. The person or persons sent as ambassadors or those entrusted with public messages to another state; also the official residence of an ambassador.

Ember days. In the Anglican and R.C. Churches, fasts of the four seasons. They are the Wed., Fri., and Sat., after the 1st Sunday in Lent; Whitsunday; Holy Cross Day (Sept. 14); Feast of St. Lucy (Dec. 13). Introduced in Eng. by St. Gregory (590-604).

Embezzlement. The fraudulent appropriation of money or other personal property by one employed in official capacity.

Embioptera. Order of insects, 4-270.

Emblems, National. *See* Floral Emblems (table).

Embroidery, 3-237; development of lace from, 4-429; Japanese, 4-352.

Embryo. Young of plant or animal in earliest stages of development from seed or egg; 3-239; of chicken, 3-230 illus.; frog spawn, 3-240 illus.; wheat germ, 3-394.

Embryology. The study of the reproduction and development of plants and animals, 3-239, 1-450, founded by von Baer, 7-527; advances in anatomy, 1-144; and evolution, 3-323.

Emden. Tn. and spt. in the *Land of Lower Saxony* N.W. Ger., at the N. end of Dortmund-Ems canal; pop. 34,100.

Emerald. Precious stone used by Man from anc. times; composed of silicate of aluminium and beryllium. Was said to possess magical qualities and cure diseases; 7-164.

Emerald Isle. The N. name for Ireland, 4-281.

Emerson, Ralph Waldo (1803-82). Amer. essayist, poet and philosopher, 3-241, 7-364.

Emery. A very hard mineral; composed of corundum (aluminium oxide), and iron formerly extensively used in powdered form as an abrasive and polisher.

Emetic. Substance administered medicinally to cause vomiting; mustard, 5-312.

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Emett, Rowland. British cartoonist. Noted for his drawings of fantastic railways, etc., in *Punch*.

Emigration. Departure from one country to settle in another; career opportunities, 2-238; famine and Irish emigration, 4-282.

Emigré. Refugees from the Fr. Rev.; influence on Louis XVI, 3-168.

Emile. Work by Rousseau on the education of children, 6-439.

Emilia. Division of N. It., S. of the Po and N. of Tuscany, pop. 3,339,000; 8,537 sq. m., 4-304.

Eminent Victorians (1918). Biographies by Lytton Strachey, 1-116.

Emin Pasha (1810-92). Turkish name of Eduard Schnitzer, Ger. explorer and administrator in Africa; rescued by Stanley, 7-115.

"Emultron." Type of kinoscope, or electron camera, used in television for photographing the picture to be televised and transmitted to a receiver. It consists of a cathode-ray tube (c.r.), the narrow end of which projects a cathode-ray beam against the broad end or screen. The latter comprises a mosaic of photo-emissive material upon which the optical image is focused, and the current variations so induced convert tone-shades of the image into electrical impulses, 7-252 illus.

Emmanuel College, Cambridge University, 2-182.

Emmet, Robert (1778-1803). Irish revolutionist who was hanged Sept. 20, 1803 for plotting a rising in Dublin.

Emmett, Daniel Decatur (1815-1904). Amer. actor and song writer, originator of "Nekto minstrel" performances; author of *Dave*.

Emotion, 3-241; and indigestion, 3-390; psychiatry, 6-299.

Emperor Moth, 2-114 illus.

Empire Day. May 24 (birthday of Queen Victoria), which is observed throughout the Brit. Commonwealth, particularly in schools; officially recognized in U.K. in 1904 but first observed in Canada in 1897.

Empire State Building, New York city, 5-112; time taken by lift to top, 4-195.

Empirical formula. In chemistry, 1-11.

Empiricism, in philosophy, 6-150.

Employment. *See* Careers.

Ems or Bad Ems. Ger. health resort on r. Lahn 10 m. E. of Coblenz; pop. 7,000.

Ems, r. in Westphalia and Hanover, Germany; flows S.W. 200 m. to North Sea; irrigates surrounding country by a series of canals.

Emu. Large flightless bird, 3-242, 1-312, 315 illus.; as relative of ostrich, 6-9, egg, 3-171 illus.

Emulsion. A liquid mixture in which a fatty substance is suspended in minute globules; 2-455.

Ene Harkness. Variety of rose, 6-452 illus. f.

Enamel and Enamelling, 3-242; in jewelry, 4-372; types of paint, 6-38.

Encaenia. Feast of dedication or renewing, esp. anniversary of dedication of church or temple. At Oxford Univ., a term for Commemoration.

Encarnación. Tn. in Paraguay; pop. 160,000; 6-76.

Encaustic (Gk., burnt in). Method of painting with colours and wax, practised by anc. Egyptians and Greeks. Technique of process not known.

Erethaster's nightshade. Plant, 5-439.

Enclosure of land, in Eng. history, 2-473, 474; effect on agriculture, 4-259.

Encyclical Letters. Ecclesiastical letters sent on some important occasions by the Pope to his bishops. An Encyclical differs from a Bull in not dealing with any special case; it indicates general principles to guide the bishops.

Encyclopaedia Britannica, 3-245.

Encyclopedia, 3-245.

ENGLISH COUNTIES : FACTS AND FIGURES

COUNTY	POSTAL ABBREVIATION	CO. TOWN	AREA Sq. m.	POP.
Bedfordshire	Beds	Bedford	473	311,844
Berkshire	Berks	Reading	725	288,763
Buckinghamshire	Bucks	Aylesbury	749	386,164
Cambridgeshire	Cambs	Cambridge	864	255,901
Isle of Ely		March	375	89,038
Cheshire		Chester	1,019	1,258,080
Cornwall		Rodmin	1,366	346,612
Cumberland		Carlisle	1,520	285,347
Derbyshire		Derby	1,066	766,000
Devon		Exeter	2,612	742,000
Dorset		Dorchester	973	291,157
Durham		Durham	1,015	1,463,410
Essex		Chelmsford	1,530	2,043,574
Gloucestershire	Glos	Gloucester	1,243	938,618
Hampshire	Hants	Winchester	1,503	1,106,617
Isle of Wight		Newport	147	95,594
Hertfordshire	Herts	Hatford	842	127,000
Hertfordshire		Hertford	692	609,735
Huntingdonshire		Huntingdon	366	69,273
Kent		Maidstone	1,525	1,583,286
Lancashire	Lancs	Lancaster	1,875	6,116,013
Leicestershire		Leicester	823	630,893
Lincolnshire	Lincs	Boston	418	101,545
Holland		Sleaford	724	131,566
Keateven		Lincoln	1,520	473,463
Lindsey			12	3,348,376
London			232	2,268,776
Middlesex	Middx	Brentford and Chiswick		
Monmouthshire	Mon	Newport	546	424,647
Norfolk		Norwich	2,054	546,550
Northamptonshire	Northants	Northampton	998	359,550
Isle of Peterborough		Peterborough	834	63,784
Northumberland		Alnwick	2,018	798,175
Nottinghamshire	Notts	Nottingham	844	840,870
Oxfordshire	Oxon	Oxford	748	275,765
Rutland		Oakham	152	20,500
Shropshire, or Salop		Shrewsbury	1,347	289,844
Somerset		Taunton	1,613	551,000
Staffordshire	Staffs	Stafford	1,153	1,621,000
Suffolk		Ipswich	871	321,849
East		Bury St	611	120,590
West		Edmunds		
Surrey		Kingston-upon-Thames	722	1,601,555
Sussex		Lewes	829	618,083
East		Chichester	628	318,661
West		Warwick	976	1,800,874
Warwickshire		Appley	789	67,383
Westmorland		Salisbury	1,345	387,400
Wiltshire	Wilts	Worcester	609	522,974
Worcestershire	Worcs	York		
Yorkshire		Beverley	1,172	482,900
East Riding		Northallerton	2,124	378,160
North Riding		Wakefield	2,775	3,480,000
West Riding				

Encyclopédie. French encyclopaedia edited by Diderot and d'Alembert, 1751-52, 3-246.

Encyclopédists. Writers of great Fr. Encyclopédie, including Diderot, d'Alembert, and other distinguished thinkers of 18th cent.; and Fr. Revolution, 3-466.

Endive (en'div). An annual plant of the family *Compositae*; probably native of East Indies, but cultivated in Europe since 16th cent.; curled or narrow-leaved varieties most used for salads.

Endocarp. The inner layer of the seed vessel of a plant; in drupaceous fruits, 2-480.

Endocrine glands. 4-28, 6-189.

Endolymph. Liquid in membranous labyrinth of ear, 3-148.

Endopterygota. Division of the class of *Insecta*, 4-270.

Endosperm. Nutritive material surrounding embryo in many seeds, 6-529.

Endurances. See *Aeronautics* (table).

Endymion (endim'ion). In Gr. myth. beautiful youth sleeping for ever in a cave on Mt. Latmos, beloved and nightly visited by Selene, moon goddess; subject of poem by Keats.

Energy. 3-245; atomic, 1-299, and chemical reactions, 2-323, 324 compressed air in pneumatic machines, 6-230; conservation of energy and chemistry, 2-923; heat as form of, 4-146; and mass in nuclear fission, 1-300; and mass in relativity, 6-381; water as source of, 7-426.

Energy levels. in atomic theory, 1-294.

Enfield. Bor. of Middx., Eng., 10 m N of London; pop. 110,100 small arms factory, 5-200.

Engadine (en'gadén). Valley of r Inn in S. Switzerland, 60 m. long, noted for picturesque scenery and health resorts, 1-122 illus.

Engels, Friedrich (1820-95). Ger. socialist writer; lived in England from 1850; friend and collaborator of Marx, 5-139, 2-174.

Enghien (an'gryan). Louis de Bourbon Duc d' (1772-1804). Fr. émigré prince, last of the Condés, seized on neutral territory as conspirator and executed by Napoleon's order though proved innocent.

Engines; aeroplane, 1-42 diag.; Diesel engine, 3-88; gas, 3-507; internal combustion engine, 4-273, 301 engine, 4-368; of locomotive, 5-2 in motor vehicle, 5-278 illus.; steam engine, 7-152, 153 illus.; 154 steam locomotive, 5-1; Trevithick's engine, 7-316.

KINGS AND QUEENS OF ENGLAND

SAXON LINE

829-839	Egbert.	934-940	Æthelstan
839-858	Æthelwulf	940-946	Edmund I
858-860	Æthelbald	946-955	Edred
860-866	Æthelbert.	955-959	Edwy.
866-871	Æthelred	959-975	Edgar.
871-901	Alfred the Great.	975-978	Edward the Martyr
901-924	Edward the Elder	978-1016	Æthelred "the Unready."

DANISH LINE

1016-1035	Canute	1035-1040	Harold I.
		1040-1042	Hardicanute

SAXON LINE

1042-1066	Edward the Confessor	1066	Harold II
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NORMAN LINE

1066-1087	William the Conqueror.	1100-1135	Henry I.
1087-1100	William II	1135-1154	Stephen.

PLANTAGENET LINE

1154-1189	Henry II.	1272-1307	Edward I
1189-1199	Richard I	1307-1327	Edward II
1199-1216	John.	1327-1377	Edward III
1216-1272	Henry III.	1377-1399	Richard II

HOUSE OF LANCASTER

1399-1413	Henry IV	1413-1422	Henry V.
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HOUSE OF YORK

1461-1483	Edward IV.	1483	Edward V.
		1483-1485	Richard III.

HOUSE OF TUDOR

1485-1509	Henry VII.	1547-1553	Edward VI
1509-1547	Henry VIII	1553-1558	Mary.
		1558-1603	Elizabeth I.

HOUSE OF STUART

1603-1625	James I.	1685-1688	James II
1625-1649	Charles I.	1688-1702	William III
1660-1685	Charles II.	1702-1714	Anne

HOUSE OF HANOVER

1714-1727	George I.	1820-1830	George IV.
1727-1760	George II.	1830-1837	William IV
1760-1820	George III.	1837-1901	Victoria.

HOUSE OF SAXE-COBURG-GOTHA

1901-1910 Edward VII.

HOUSE OF WINDSOR

1910-1936	George V.	1936-1939	George VI.
	Edward VIII	1952-	Elizabeth II.

ENGINEERING

Engineering; careers in aeronautical engineering, 2-232; chemical engineering as a career, 2-234; civil engineering, 2-234; electrical engineering, 2-236; marine and locomotive, 2-238; mining, 2-238; production engineering, 2-240; problem of friction, 2-470; mechanics and, 5-156; use of models, 5-228.

England. Southern part (not including Wales) of isl. of Gt. Brit.; area 50,337 sq. m.; pop. 41,572,500 (including Monmouthshire); cap. London; 3-247; map f. 3-248; flag, 3-333; St. George as patron saint, 3-520; carpets, 2-249; coinage, 5-235; common land, 2-474; exhibitions, 3-327, 328; fireworks, 3-364; felt-hat industry, 4-137; gypsies, 4-110; harvest home custom, 4-135; holidays, 4-188; lace-making, 4-429; meals, 5-151; New Year's Day, 5-409; cricket, 2-528; football, 3-414; Church of England, 2-386; Free Churches, 3-463.

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Englehart, George (1750-1829). Brit. miniaturist, 3-258.

English Art, 3-258; impressionism, 4-237; landscape painting, 6-34; the Pre-Raphaelites, 6-283; architecture, 1-210; arch, 1-201, 202 illus.; Adam style, 1-14; Queen Anne style, 1-158 illus.; Regency

architecture, 1-217, 218, 2-70, 72 illus.; glass-making, 4-31 illus.; music, 5-306. See also **Castle**; **Cathedral**.

English Channel (Fr., La Manche). Stretch of water separating the S. shore of Eng. from the N.W. coast of Fr.; boat services from Dover, 3-109; Blériot's flight, 1-435; submarine cable service, 2-152.

English History, 3-275. See also **Britain**, **United Kingdom** and separate entries on battles, treaties and historical figures.

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For history from 1707 to present day see **United Kingdom**. See also **Britain**; **British Commonwealth**.

SIGNIFICANT DATES IN ENGLISH HISTORY

- | | |
|------------|---|
| 55-51 B.C. | Julius Caesar invades Britain. |
| A.D. | |
| 43-410. | Romans rule Britain. Insurrection of Queen Boadicea put down A.D. 69 |
| 449-700. | Anglo-Saxons conquer the land ("Angle-land," or England). |
| 597. | St. Augustine reintroduces Christianity. |
| 829. | England united under one king (Egbert of Wessex). |
| 878. | Alfred checks the raids of the Danes. |
| 1016-1042. | Danes rule England (Canute). |
| 1066. | William Duke of Normandy conquers England; feudalism introduced. |
| 1154-1189. | Henry II (Plantagenet) rules over England, and holds Normandy, Anjou, Aquitaine, etc., in France. Conquest of Ireland begun. |
| 1199-1216. | John loses Normandy and Anjou; forced to grant Magna Carta (1215). |
| 1282. | Edward I conquers Wales; calls Model Parliament (1295). |
| 1314. | Edward II defeated by Scots at Bannockburn; attempt to conquer Scotland fails. |
| 1338-1453. | Hundred Years' War with France. Victories at Crécy (1346), Poitiers (1356), Agincourt (1415); Henry V king of France as well as England, 1420; Joan of Arc turns the tide against the English (1429-31). |
| 1381. | Revolt of peasants under Wat Tyler. |
| 1399. | Richard II overthrown by Henry IV (House of Lancaster). |
| 1450. | Jack Cade's Rebellion. |
| 1455-1485. | Wars of the Roses (red rose of Lancaster against white rose of York). |
| 1485. | Henry VII (Lancaster) defeats Richard III (York) at Bosworth and ends the war. Strong monarchy established under the Tudor dynasty. |
| 1534. | Henry VIII breaks the ties which linked the English Church to Rome. |
| 1553-1558. | Mary I restores Roman Catholic Church. |
| 1558-1603. | Elizabeth I re-establishes the Church of Eng. and; great development in industry, sea-power, and literature (Shakespeare). |
| 1588. | Spanish Armada defeated. |
| 1603. | Scotland united with England in personal union under James I (Stuart). |
| 1642-1648. | Civil War between Parliament and King Charles I, over religion and rights of Parliament; Charles beheaded, 1649; England becomes a Commonwealth (republic). |
| 1653-1658. | Oliver Cromwell rules England, Scotland, and Ireland as "Lord Protector." |
| 1660. | Stuart line restored in Charles II. |
| 1688-1689. | "Glorious Revolution" drives James II from the throne, and establishes the Protestant succession with William III and Mary II as joint sovereigns. |
| 1702-1713. | War of the Spanish Succession. Preserves the Protestant succession for England, curbs the power of France, and paves the way for the increase of England's colonial empire (Marlborough's victory at Blenheim, 1704). Peace of Utrecht, 1713. |
| 1707. | Union of England and Scotland into the United Kingdom of Great Britain. |

ENGLISH LANGUAGE

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English Pale, The. Colonised area around Dublin, Ireland; settlers in, 4-282.

English setter. Sporting dog, 3-101 illus. f.

Engraving, 3-292; Dürer's art, 3-138; process engraving, 6-292.

Ennerdale Water. In Lake district of Cumberland, Eng., about 2½ m. long, 4-439.

Enniskillen or Inniskilling. Co. tn. of Fermanagh, Northern Ire.; pop. 6,318; defeat of James II's forces at battle of Cromlin 1689; famous regiment "Inniskilling Dragoons" formed by defenders; 3-316.

Ennius [en'ius], Quintus (239-169 B.C.). Latin epic poet, called "father of Rom. poetry," 4-450.

Enoch [en'ok]. Hebrew patriarch, father of Methuselah, who "walked with God" and after 365 years "was not for God took him" (Gen. v. 18-24). In Hebrew legend he is the inventor of arithmetic, writing, astronomy and astrology.

En'sa (Entertainments National Service Association). Body formed in 1939 by Basil Dean which provided entertainment for Brit. and Allied troops etc. Disbanded 1946.

Enschede [enskh'de]. Netherlands. Mfg. tn. near E. border; pop. 106,882; cotton-spinning, weaving, etc.; 5-370.

En'sign [en'sn]. National flag flown on the ensign staff; there are three Brit. ensigns, red, white, and blue, each with the Union Jack in the upper corner next to the staff; the red is for the merchant navy; white for the Navy and the Royal Yacht Squadron; blue for the Royal Naval Reserve; 3-385.

Ensign. Former commissioned rank in Brit. army, held by infantry officers when first commissioned, it being their duty to carry and guard the regimental colours. Abolished 1871, rank of 2nd lieutenant being substituted. In U.S. navy ensign is the lowest rank of officer, equivalent to midshipman in the R.N.

***Ensilage**. Process of preserving grass for fodder, 4-64.

Ensor, James (1860-1949). Belg. artist, 1-422.

ENZYMES

Entail. Law restricting inheritance to a particular heir or class of heirs.

Enteb be. Cap. of Uganda Protectorate, Africa, on N.W. shore of Lake Victoria; centre of a cotton-growing dist.; pop. 8,000; 7-343.

Entente Cordiale (Fr., cordial understanding). Phrase current in early 20th cent. signifying friendly relations between the U.K. and Fr. The entente began soon after the Boer War, and was stimulated by Edward VII. Led to alliance of two nations in 1st World War.

Enteromorpha, a green seaweed; 1-104.

Entomology. Branch of zoology which deals with insects, their classification, habitat, life, structure; work of Fauré, 3-335. *See Insects.*

Entr'acte. *See Musical Terms* (table).

Entrepreneur [ontr'prenz]. In economics, Fr. word for the manager or organizer; function of, 3-160.

Enver Pasha (1879-1922). Turkish politician and soldier, a leader of the Young Turks; helped to depose Abdul Hamid, and to bring Turkey into the 1st World War; died in action at Bokhara.

Environment, and heredity, 4-168.

See also Ecology; Evolution.

Envoy extraordinary. A diplomatic representative, 1-131.

Enzymes. Substances produced by living tissues which bring about chemical changes in other substances, e.g. the enzyme produced by yeast (zymase) which ferments sugar, 3-293, 1-96, 2-287, 3-346, as organic catalysts, 2-323; and bacteria, 1-341.

FAMOUS NAMES IN ENGLISH LITERATURE

(Note: for dramatic works, see list under Drama)

* **Joseph Addison** (1672-1719), poet and essayist--Sir Roger de Coverley Papers in *The Spectator*.

William Harrison Ainsworth (1805-82), historical novelist--

"Old Saint Paul's" and "The Tower of London"

Matthew Arnold (1822-88), poet and essayist--"The Scholar

Gipsy"; "Thyrsis"; "Essays in Criticism"

Roger Ascham (1515?-88), scholar--"Toxophilus"; "The

Schoolmaster"

Jane Austen (1775-1817), novelist--"Pride and Prejudice";

"Mansfield Park"; "Sense and Sensibility"; "Persuasion"; "Emma"; "Northanger Abbey"

François Bacon (1561-1626), philosopher and essayist--"New

Atlantis"; "The Advancement of Learning"; "Essays."

Roger Bacon (1214?-94?), philosopher--"Opus Majus"

John Barbour (1316?-95), poet--"The Brus"

* **William Barnes** (1801-80), Dorset dialect poet--"Linden Lea"

Sir James Matthew Barrie (1860-1937), Scottish novelist--

"The Little Minister"; "Sentimental Tommy"; "A

Window in Thrums."

Bede (677?-735), historian--"Ecclesiastical History of the

English Nation."

Sir Max Beerbaum (1872-1956), essayist and satirical novelist--

"The Happy Hypocrite"; "Zuleika Dobson."

Hilaire Belloc (1870-1953), poet, essayist, novelist, historian,

biographer--"On Nothing"; "Richelieu"; "The Path

to Rome"; "The Bad Child's Book of Beasts"; "Mr

Emmanuel Burden"; "The Four Men."

Arnold Bennett (1867-1931), novelist--"Anna of the Five

Towns"; "The Old Wives' Tale"; "Clayhanger";

"Riceyman Steps"

A. C. Benson (1862-1925), essayist and literary critic--"The

Upton Letters"; "From a College Window"

Richard Doddridge Blackmore (1825-1900), novelist--"Lorna

Doonee"

William Blake (1757-1827), poet--"Songs of Innocence";

"Songs of Experience"

George Borrow (1803-81), prose writer--"The Bible in Spain";

"Lavengro"; "The Romyany Rye"

James Boswell (1740-95), biographer--"Life of Samuel

Johnson"

Robert Bridges (1874-1930), poet--"The Growth of Love";

"The Testament of Beauty"

Charlotte Brontë (1816-55), novelist--"Jane Eyre"; "Vil-

lette"; "Shirley"

Emily Brontë (1818-48), novelist and poet--"Wuthering

Heights"; "Collected Poems"

Rupert Brooke (1887-1915), poet--"The Soldier"; "These

I Have Loved"; "The Old Vicarage, Grantchester"

Sir Thomas Browne (1605-82), prose writer--"Religio Medici";

"Hydriotaphia."

Elizabeth Barrett Browning (1806-61), poet--"Sonnets from

the Portuguese"; "Aurora Leigh."

Robert Browning (1812-89), poet--"The Ring and the Book";

"Pippa Passes"; "Rabbi Ben Ezra"; "The Pied

Piper of Hamelin."

John Buchan (1875-1940), Scottish novelist--"The Thirty

nine Steps"; "Greenmantle"

John Bunyan (1628-88), prose writer--"The Pilgrim's

Progress"; "Grace Abounding"

Edmund Burke (1729-97), political philosopher--"Reflections

on the Revolution in France"; "On Conciliation with the

"Colonies"; "Letters on a Regicide Peace"

Fanny Burney (Mme. d'Arblay, 1752-1840), novelist and

diarist--"Evelina"; "Diary and Letters of Madame

d'Arblay."

Robert Burns (1759-96), Scottish poet--"The Cottar's Saturday

Night"; "Tam o' Shanter"; "To a Field-mouse"

Sir Richard Burton (1821-90), prose writer and translator--

"Pilgrimage to El Medina and Mecca"; "The Arabian

Nights" (trans.)

Robert Burton (1577-1640) prose writer--"The Anatomy of

Melancholy."

Joseph Butler (1692-1752), philosopher and theologian--"The

Analogy of Religion."

Samuel Butler (1612-80), satirical and poet--"Hudibras."

Samuel Butler (1835-1902), satirical novelist and critic--"The

Way of All Flesh"; "Erewhon"; "Notions"

Lord Byron (1788-1824), poet--"Childe Harold's Pilgrimage";

"Don Juan"; "Manfred"; "The Prisoner of

Chillon."

Cedmon (died 680), poet--"Paraphrases (of the Bible)."

Thomas Campbell (1777-1844), poet--"Hohenlinden"; "Ye

Mariners of England."

Thomas Campion (1567-1620), poet--"A Book of Ayres";

"Songs of Mourning"

Thomas Carlyle (1795-1881), Scottish historian and essayist--

"Sartor Resartus"; "The French Revolution";

"Heroes and Hero-worship"; "Frederick the Great"

Lewis Carroll (Charles L. Dodgson, 1832-98), writer for children--

"Alice's Adventures in Wonderland"; "Through the

Looking-Glass"; "The Hunting of the Snark"

George Chapman (1559?-1634), poet and translator--Homer's

Iliad and Odyssey (trans.).

Thomas Chatterton (1752-70), poet--"The Rowley Poems."

Geoffrey Chaucer (1340?-1400), poet--"The Canterbury

Tales."

Gilbert Keith Chesterton (1874-1936), poet, essayist, novelist,

and critic--"The Man Who Was Thursday"; "The

Flaming Inn"; "Heretics"; "Tremendous Trifles";

"The Ballad of the White Horse"

John Clare (1793-1864), poet--"Poems Descriptive of Rural

Life and Scenery"; "The Shepherd's Calendar."

William Cobbett (1732-1835), political and sociological writer--

"Rural Rides."

FAMOUS NAMES IN ENGLISH LITERATURE (cont.)

- Samuel Taylor Coleridge** (1772-1834), poet and critic—"The Rime of the Ancient Mariner"; "Kubla Khan".
- William Wilkie Collins** (1824-80), novelist—"The Woman in White"; "The Moonstone".
- Joseph Conrad** (1857-1924), novelist—"The Nigger of the 'Narcissus'"; "Almayer's Folly"; "The Secret Agent"; "Typhoon".
- Abraham Cowley** (1618-67), poet and essayist—"Pindarique Odes"; "Davideis"; "The Mistress".
- William Cowper** (1731-1800), poet—"The Task"; "John Gilpin".
- George Crabbe** (1754-1832), poet—"The Village"; "The Borough".
- Cynwulf** (8th or 9th century), poet—"Christ"; "St. Juliana".
- Charles Darwin** (1809-82), scientific writer—"The Origin of Species".
- Daniel Defoe** (1661-1731), novelist and journalist—"Robinson Crusoe"; "Moll Flanders"; "A Journal of the Plague Year".
- Walter de la Mare** (1873-1956), poet and novelist—"Memoirs of a Midget"; "The Listeners"; "Peacock Pie".
- Henry Deeken** (1812-70), poet—"On the Edge"; "Peace".
- William De Morgan** (1839-1917), novelist—"Joseph Vance"; "Alice-for-Short".
- Thomas De Quincey** (1785-1859), essayist and critic—"Confessions of an English Opium Eater"; "On Murder Considered as One of the Fine Arts".
- Charles Dickens** (1812-70), novelist—"David Copperfield"; "The Pickwick Papers"; "A Christmas Carol"; "Oliver Twist", etc.
- Benjamin Disraeli**, Earl of Beaconsfield (1804-81), novelist—"Vivian Grey"; "Coningsby"; "Sybil".
- John Donne** (1573-1631), poet and preacher.
- Charles Montague Doughty** (1843-1920), writer on travel—"Arabian Deserts".
- Norman Douglas** (1868-1952), novelist—"South Wind"; "Old Calabria"; "Late Harvest".
- Ernest Dowson** (1867-1900), poet—"Cynara".
- Sir Arthur Conan Doyle** (1859-1930), novelist—"The Adventures of Sherlock Holmes"; "The White Company"; "Rodney Stone"; "The Lost World", etc.
- Michael Drayton** (1563-1631), poet—"Agincourt"; "Polyolbion".
- John Drinkwater** (1882-1937), poet, critic, and biographer—"Collected Poems".
- William Drummond** (1585-1619), poet and historian—"Flowers of Sion"; "The Cypress Grove".
- John Dryden** (1631-1700), poet—"Astraea Redux"; "Alexander's Feast"; "Ode on St. Cecilia's Day"; "Absalom and Achitophel".
- William Dunbar** (1465?-1525?), poet—"Two Married Women and the Widow"; "The Dance of the Seven Deadly Sins".
- Lord Dunsany** (Edward Plunket, 1878-1948), story writer—"The Sword of Welleran".
- Maria Edgeworth** (1767-1849), novelist—"Castle Rackrent"; "The Absentee".
- George Eliot** (Mary Ann Evans, 1819-80), novelist—"Adam Bede"; "The Mill on the Floss"; "Silas Marner".
- Thomas Stearns Eliot** (1898-1962), poet and critic—"The Waste Land"; "Four Quartets"; "Ash Wednesday".
- John Evelyn** (1620-1706), diarist and writer—"Diary"; "Sylva".
- Henry Fielding** (1701-54), novelist—"Tom Jones"; "Joseph Andrews"; "Jonathan Wild".
- Edward Fitzgerald** (1809-83), poet and translator—"Omar Khayyam" (trans.).
- James Elroy Flecker** (1884-1915), poet—"The Golden Journey to Samarkand"; "The King of Aisler"; "Hassan".
- Giles Fletcher** (1587-1623), poet—"Christ's Victories".
- Cecil Scott Forester** (1809-91), novelist—"Brown on Resolution"; "A Ship of the Line"; "Captain Hornblower, R.N."; "Mr. Midshipman Hornblower".
- Edward Morgan Forster** (1879-1970), novelist—"A Passage to India"; "A Room with a View"; "Howard's End".
- Sir James George Frazer** (1854-1941), Scottish anthropological writer—"The Golden Bough".
- James Anthony Froude** (1818-94), historian—"The History of England from the Fall of Wolsey to the Defeat of the Spanish Armada"; "Short Studies on Great Subjects".
- John Galsworthy** (1867-1933), novelist and short-story writer—"The Forsyte Saga"; "A Modern Comedy".
- Elizabeth Gaskell** (1810-65), novelist—"Cranford"; "Mary Barton"; "North and South"; "Sylvia's Lovers".
- John Gay** (1685-1732), poet—"The Shepherd's Week"; "Fables"; "Trivia".
- Geoffrey of Monmouth** (1110?-54), historian—"Historia Britonum".
- Edward Gibbon** (1737-94), historian—"The Decline and Fall of the Roman Empire".
- George Gissing** (1857-1903), novelist—"The Private Papers of Henry Ryecroft"; "The Whirlpool"; "The New Grub Street".
- William Godwin** (1756-1836), political writer and novelist—"Inquiry concerning Political Justice"; "Caleb Williams".
- Oliver Goldsmith** (1728-74), novelist, poet, and essayist—"The Vicar of Wakefield"; "The Deserted Village".
- Sir Edmund Gosse** (1849-1928), poet and critic—"Father and Son"; "History of Modern English Literature".
- John Gower** (1330?-1408), poet—"Confessio Amantis".
- Kenneth Grahame** (1859-1932), writer of children's stories—"The Golden Age"; "The Wind in the Willows".
- Robert R. Graves** (1895-1963), poet, critic, and historical novelist—"Goodbye to All That"; "I, Claudius"; "King Jesus".
- Thomas Gray** (1716-71), poet—"Elegy written in a Country Churchyard"; "The Progress of a Poessy".
- John Richard Green** (1837-83), historian—"A Short History of the English People".
- Graham Greene** (1904-1992), novelist—"Brighton Rock"; "The Power and the Glory"; "The Heart of the Matter".
- Robert Greene** (1500?-92), poet—"Sweet are the Thoughts"; "Sappho's Song to her Child".
- Julian Grenfell** (1898-1915), poet—"Into Battle"; "To a Black Greyhound".
- Fulke Greville, Lord Brooke** (1554-1628), poet—"Coelia"; "Treatise of Monarchy".
- George Grote** (1794-1871), historian—"History of Greece".
- Sir H. Rider Haggard** (1856-1925), writer of adventure stories—"King Solomon's Mines"; "She"; "Allan Quatermain".
- Richard Hakluyt** (1552?-1616), historian—"Principal Voyages of the English Nation".
- Thomas Hardy** (1840-1928), novelist and poet—"Far from the Madding Crowd"; "The Return of the Native"; "Tess of the D'Urbervilles"; "Wessex Poems"; "The Dynasts".
- William Hazlitt** (1778-1830), essayist and critic—"Table Talk"; "Characters of Shakespeare's Plays".
- William Ernest Henley** (1849-1903), poet and critic—"London Voluntaries"; "Hospital Sketches".
- George Herbert** (1833-33), poet—"The Temple".
- Robert Herrick** (1591-1633), poet—"Hesperides".
- Maurice Hewlett** (1861-1923), novelist and poet—"Richard Yea-and-Nay"; "The Queen's Quair"; "The Forest Lovers".
- James Hilton** (1900-54), novelist—"Lost Horizon"; "Good-bye, Mr. Chips".
- Thomas Hobbes** (1588-1679), philosopher—"Leviathan".
- Raphael Holinshed** (d. c. 1580), historian—"Chronicles".
- Thomas Hood** (1799-1845), poet and humorist—"The Song of the Shirt"; "Miss Kilmansegg"; "The Bridge of Sighs"; "I Remember, I Remember".
- Richard Hooker** (1534?-1600), theologian—"Laws of Ecclesiastical Polity".
- Anthony Hope** (Anthony Hope Hawkins, 1863-1933), novelist—"The Prisoner of Zenda"; "Rupert of Hentzau".
- Gerald Manley Hopkins** (1844-89), poet—"Collected works".
- Alfred E. Housman** (1859-1936), poet—"A Shop-dire Lad".
- Laurence Housman** (1865-1933), poet—"Green Ardas"; "Mendicant Rhymes"; "Little Plays of St. Francis".
- William Henry Hudson** (1841-1922), nature-writer and novelist—"Green Mansions"; "A Shepherd on the Wiltshire Downs"; "The Crystal Age".
- David Hume** (1711-76), philosopher and historian—"Inquiry concerning Human Understanding".
- Leigh Hunt** (1784-1859), essayist and poet—"About Ben Adhem"; "The Story of Rimini"; "Autobiography".
- Aldous Huxley** (1894-1963), novelist and essayist—"Brave New World"; "Point Counter Point".
- William Wymark Jacobs** (1863-1913), humorist—"Many Cargoes"; "The Skipper's Wooing"; "Odd Craft"; "Short Cruises".
- James I of Scotland** (1391-1437), poet—"The Kingis Quair".
- Richard Jefferies** (1848-87), nature-writer and novelist—"Wood Magic"; "The Story of My Heart"; "The Open Air".
- Jerome K. Jerome** (1859-1927), humorist—"Three Men in a Boat".
- Samuel Johnson** (1709-84), essayist and lexicographer—"A Dictionary of the English Language"; "The Lives of the Poets".
- Ben Jonson** (1573?-1637), poet—"Drink to Me Only with Thine Eyes".
- James Joyce** (1882-1941), poet and novelist—"Portrait of the Artist as a Young Man"; "Ulysses"; "Fomes Penyeach".
- John Keats** (1795-1821), poet—"Ode to a Nightingale"; "Ode on a Grecian Urn"; "Endymion"; "La Belle Dame Sans Merci".
- Alexander Kinglake** (1809-91), historian—"History of the Crimean War"; "Rothen".
- Charles Kingsley** (1819-75), novelist—"Westward Ho!"; "The Water-Babies"; "Hypatia".
- Rudyard Kipling** (1865-1936), novelist, poet, and short-story writer—"Kim"; "Barrack Room Ballads"; "Puck of Pook's Hill"; "Just So Stories"; "The Jungle Book"; "Soldiers Three".
- Charles Lamb** (1775-1834), poet and essayist—"Essays of Elia"; "Tales from Shakespeare" (with Mary Lamb).
- Walter Savage Landor** (1775-1864), poet and prose writer—"Imaginary Conversations"; "Helens".
- William Langland** (1300?-1400?), poet—"The Vision of Piers Plowman".

FAMOUS NAMES IN ENGLISH LITERATURE (concluded)

- David Herbert Lawrence (1885-1930), poet, novelist, and essayist—"Sons and Lovers."
- Leysellon (about 1200), metrical historian—"Brut."
- Geoffrey Day Lewis (1904-), poet and critic—"Poetry for You"; "Word Over All."
- John Locke (1632-1704), philosopher—"Essay Concerning Human Understanding."
- Thomas Lodge (1558?-1625), poet and romance writer—"Rosalinda."
- Richard Lovelace (1618-58), poet—"To Althea from Prison."
- John Lydgate (1373?-1400?), poet—"Troy Book."
- John Lyly (1553?-1606), novelist—"Euphues: The Anatomy of Wit"; "Euphues and his England."
- Sir David Lindsay (1480-1555), Scottish poet—"The Dreme"; "The Testament of Squyer Meldrum"; "An Satyre of the Thrie Estaites."
- Edward Bulwer-Lytton, Lord Lytton (1803-73), novelist—"The Last Days of Pompeii"; "Harold, the Last of the Saxons"; "My Novel."
- Thomas Babington, Lord Macaulay (1800-59), historian, poet, and essayist—"History of England"; "Lays of Ancient Rome"; "Critical and Historical Essays."
- Louis Macneile (1907-), poet—"The Earth Compels"; "Christopher Columbus"; "The Dark Tower."
- Sir Thomas Malory (died 1470?), translator—"Morte d'Arthur."
- Katherine Mansfield (1890-1923), short-story writer—"In a German Pension"; "Bliss"; "The Dove's Nest."
- Christopher Marlowe (1564-93), poet—"Come Live with Me and Be My Love"; "Hero and Leander."
- Andrew Marvell (1621-78), poet and satirist—"To his Coy Mistress"; "Horatian Ode to Cromwell"; "Thoughts in a Garden."
- John Massfield (1875-), poet and novelist—"Salt-Water Ballads"; "The Everlasting Mercy"; "Dauber"; "Reynard the Fox"; "Sard Harker."
- W. Somerset Maugham (1874-), novelist and short-story writer—"Of Human Bondage"; "Cakes and Ale"; "The Painted Veil."
- George Meredith (1828-1909), novelist and poet—"The Egoist"; "The Ordeal of Richard Feverel"; "Diana of the Crossways."
- Alice Meynell (1850-1922), poet and essayist—"Preludes"; "Renouncement"; "The Rhythm of Life."
- John Stuart Mill (1806-73), philosopher and economist—"Principles of Political Economy"; "System of Logic"; "On Liberty."
- John Milton (1608-74), poet—"Paradise Lost"; "L'Allegro"; "Il Penseroso"; "Lycidas"; "Samson Agonistes."
- Mary Russell Mitford (1787-1855), novelist—"Our Village."
- George Moore (1852-1933), novelist—"Esther Waters"; "The Brook Kerith."
- Sir Thomas More (1478-1535), prose writer—"Utopia."
- Charles Morgan (1894-), novelist—"The Fountain"; "Portrait in a Mirror"; "The Voyage."
- William Morris (1834-96), poet—"The Earthly Paradise"; "Poems by the Way."
- John Henry Newman (1801-90), essayist and poet—"Apologia pro Vita Sua"; "The Dream of Gerontius"; "Lead, Kindly Light" (hymn).
- Alfred Noyes (1880-), poet—"Tales of the Mermals Tavern"; "The Wine Press"; "Drake (an English Epic)."
- Walter Pater (1839-94), essayist—"Imaginary Portraits"; "Marius the Epicurean"; "The Renaissance."
- Thomas Love Peacock (1786-1866), poet and romantic novelist—"Headlong Hall"; "Nightmare Abbey."
- Samuel Pepys (1633-1703), diarist—"Diary."
- Alexander Pope (1686-1744), poet and translator—"The Rape of the Lock"; "Essay on Criticism"; "Essay on Man"; "Homer's Iliad and Odyssey" (trans.).
- John Boynton Priestley (1894-), novelist and essayist—"The Good Companions"; "Angel Pavement"; "Rain Upon Godshill"; "Midnight in the Desert."
- Sir Arthur Quiller-Couch ("Q") (1863-1944), poet, critic, and novelist—"On the Art of Writing"; "The Astonishing History of Troy Town."
- Ann Radcliffe (1764-1823), novelist—"The Mysteries of Udolpho."
- Sir Walter Raleigh (1552-1618), historian—"History of the World."
- Charles Reade (1814-84), novelist—"The Cloister and the Hearth"; "It's Never Too Late to Mend."
- Samuel Richardson (1689-1761), novelist—"Pamela, or Virtue Rewarded"; "Clarissa, or the History of a Young Lady."
- Christina Rossetti (1830-94), poet—"Sing-Song"; "Goblin Market."
- Dante Gabriel Rossetti (1828-82), poet—"The Blessed Damozel"; "The House of Life."
- John Ruskin (1818-1900), art critic and essayist—"Modern Painters"; "The Seven Lamps of Architecture"; "Sesame and Lilies."
- Bertrand Russell (Lord Russell) (1872-), philosopher and sociologist—"Problems of Philosophy"; "Roads to Freedom"; "History of Western Philosophy."
- George William Russell ("AE") (1867-1936), poet and essayist—"Homeward"; "Gods of War"; "The Interpreters"; "The National Being."
- Victoria Sachville-West (1892-), poet and novelist—"The Land"; "The Edwardians"; "All Passion Spent."
- George Saintsbury (1845-1933), critic and historian—"A History of Criticism"; "A Short History of English Literature."
- Siegfried Sassoon (1886-), poet and novelist—"Counter-Attack"; "Memoirs of a Fox-Hunting Man."
- Sir Walter Scott (1771-1832), Scottish poet and historical novelist—"Marmion"; "Waverley"; "Ivanhoe"; "Kenilworth," and other "Waverley Novels."
- William Shakespeare (1564-1616), poet—"Sonnets"; "Venus and Adonis."
- George Bernard Shaw (1856-1950), essayist and novelist—"The Intelligent Woman's Guide to Socialism and Capitalism"; critical prefatory essays to his many plays.
- Mary Wollstonecraft Shelley (1797-1851), novelist—"Frankenstein."
- Percy Bysshe Shelley (1792-1822), poet—"Ode to the West Wind"; "Prometheus Unbound"; "To a Skylark"; "Adonais."
- Sir Philip Sidney (1554-86), poet—"Astrophel and Stella"; "Arcadia."
- Edith Sitwell (1887-), poet and essayist—"Wheels"; "The Wooden Pegasus"; "The English Eccentrics"; "Alexander Pope"; "Collected Poems."
- Sir Osbert Sitwell (1892-), satirist, poet, and essayist—"Before the Bombardment"; "Sing High, Sing Low"; "Left Hand, Right Hand"; "The Scarlet Tree"; "Great Morning"; "Laughter in the Next Room."
- Tobias Smollett (1721-71), novelist—"Roderick Random"; "Humphrey Clinker"; "Ferginle Pickle."
- Robert Southey (1774-1843), poet and historian—"After Blenheim"; "The Inchcape Rock"; "Life of Nelson."
- Edmund Spenser (1552?-99), poet—"The Faerie Queene"; "The Shepherdes Calendar."
- Sir Richard Steele (1672-1729), essayist—"Essays in the Spectator and the Tatler."
- James Stephens (1852-1950), poet, short-story writer, and novelist—"The Hill of Visions"; "The Crook of Gold."
- Laurence Sterne (1713-68), novelist—"Tristram Shandy"; "A Sentimental Journey."
- Robert Louis Stevenson (1850-94), Scottish novelist, essayist and poet—"Treasure Island"; "Kidnapped"; "Travels With a Donkey"; "A Child's Garden of Verses."
- Giles Lytton Strachey (1880-1932), biographer—"Eminent Victorians"; "Queen Victoria."
- Henry Howard, Earl of Surrey (1516-47), poet—"Sonnets."
- Jonathan Swift (1667-1745), satirist—"Gulliver's Travels"; "The Tale of a Tub"; "Journal to Stella."
- Algernon Charles Swinburne (1837-1909), poet—"Atlanta in Calydon"; "Songs before Sunrise."
- John Addington Symonds (1840-93), critic—"The Renaissance in Italy."
- Alfred, Lord Tennyson (1809-92)—"Idylls of the King"; "In Memoriam"; "Locksley Hall"; "The Lotus-Eaters"; "Ulysses," etc.
- William Makepeace Thackeray (1811-63), novelist—"Vanity Fair"; "Henry Esmond"; "Pendennis."
- Francis Thompson (1859-1907), poet—"The Hound of Heaven."
- James Thomson (1700-48), poet—"The Seasons"; "The Castle of Indolence"; "Rule, Britannia."
- George Macaulay Trevelyan (1876-), historian—"History of England"; "English Social History."
- Anthony Trollope (1815-82), novelist—"Barchester Towers" (and other books about "Barsetshire").
- William Tyndale (1492?-1536), translator and tract writer—"The New Testament" (trans.).
- Henry Vaughan (1622-95), poet—"Poems"; "The Retreat"; "My Soul, There is a Country."
- Horace Walpole (1717-97), novelist and letter writer—"The Castle of Otranto"; "Letters"; "Memoirs."
- Sir Hugh Walpole (1884-1941), novelist—"Mr. Parrin and Mr. Traill"; "Fortitude"; "The Herries Chronicle."
- Isaac Walton (1593-1683), essayist and biographer—"The Compleat Angler"; "Lives."
- Herbert George Wells (1866-1946), novelist, sociologist, and historian—"Tono-Bungay"; "The Time Machine"; "The Outline of History"; "The Shape of Things to Come."
- Gilbert White (1720-98), naturalist—"Natural History and Antiquities of Selborne."
- Oscar Wilde (1856-1900), poet, novelist, and critic—"The Ballad of Reading Gaol"; "The Picture of Dorian Gray."
- Pelham Grenville Wodehouse (1891-), humorist—"Love Among the Chickens"; "Piccadilly Jim"; many short stories about Jeeves.
- Virginia Woolf (1882-1941), novelist and critic—"Mrs. Dalloway"; "To the Lighthouse"; "Orlando"; "The Waves."
- William Wordsworth (1770-1850), poet—"Tintern Abbey"; "Intimations of Immortality"; "The Prelude."
- Sir Thomas Wyatt (1502-42), poet—"Sonnets and Lyrics."
- William Butler Yeats (1865-1939), Irish poet and essayist—"The Wild Swans at Coole"; "Ideas of Good and Evil"; "The Lake Isle of Innisfree."
- Edward Young (1683-1766), poet—"The Complaint, or Night Thoughts."

EOCENE PERIOD

Eocene period. In geology, 3-515, 516.
Eohippus. Diminutive horse of the Eocene period, 4-196, 1-156 illus.
Eoliths. Primitive stone implements, among the earliest tools or weapons of early Man, 6-106, 7-162.
Eos. Gk. name for goddess of the dawn, 1-310.
Eostre. Anglo-Saxon dawn goddess; and Easter festival, 3-151.
Eozoic period. In geology, 3-515.
Epaminondas [epaminondas]. (c. 418-362 B.C.). Theban general and statesman, 7-266.
Epfe, Charles Michel, Abbé de l' (1712-89). Fr. founder of first school for deaf, 3-56.
Epfe, duelling sword; in fencing, 3-345.
Epernay. Tn. of Fr., in dept. of Maine. Industries include spinning, tanning cork and cork-making, brewing. Centre of Fr. champagne production; wine is stored in cellars hollowed out of the chalk rock. Pop. 20,000.
Eph'edrine. Alkaloid extracted from sub-tropical herbs of genus *Ephedra*; used for treatment of allergic diseases; from Ma Huang 3-127.
Ephemeroptera [ephemeroptera]. An order of winged insects, comprising the may-flies, 4-270.
Ephesus [efesus]. Anc. Gk. city, greatest of 12 on coast of Asia Minor; Temple of Artemis (Diana), one of Seven Wonders of World, 3-86, 7-1, 3 illus. Also sent of 2 notable Church councils in 5th cent.; St. Paul laboured there 3 years (Epistle to the Ephesians).
Ephors. Officials of Sparta 7-124.
Ephraim [efraim]. Hebrew patriarch, younger son of Joseph; ancestor of tribe of Ephraim (Joshua xvi).
Ephraim, Mt. in Palestine, 25 m. N. of Jerusalem; one of the many low peaks in the ridge extending S. from Lebanon Mts.
Epic poetry. Narrative poetry which deals in an elevated style with some important action, usually heroic; e.g. Homer's *Iliad* and *Odyssey*; Dante's *Divine Comedy*, Milton's *Paradise Lost*, 6-235.
Epicletus (c. A.D. 100). Gk. Stoic philosopher who taught that Man must find happiness within himself and not in his surroundings, 6-160.
Epicure. Variety of early potato, 6-273.
Epicurus (341 270 B.C.). Gk. philosopher who taught that the aim of life was pleasure, not, as is so mistakenly thought, sensual pleasure, but pleasure in virtue and righteousness; as founder of the Epicureans, 6-159.
Epidaurus. Tn. of Argolis, in anc. Greece. Famous for its temple of Aesculapius, god of healing. Excavations since 1881 have revealed remains of this, and also an anc. Gk. theatre, 4-93 illus.
Epidemic. A disease widespread for a time in certain region; opposed to endemic disease, one continually prevalent in a region.
Epidermis. Top layer of skin beneath hair; horn as variety of, 4-193; removed in leather mfr., 4-46.
Epiglottis. Lid at base of tongue that covers the larynx during act of swallowing.
Epileptic fits, first aid for, 3-368.
Epimetheus [epimithus]. In Gk. myth., brother of Prometheus and husband of Pandora.
Epinal. Tn. of Fr., cap. of dept. of Vosges; industries include textiles, embroidery and hat making, 3-434, 437.
Epiphany [epifani]. A festival of the Christian Church kept on January 6 in commemoration of the showing (Gk. *epiphaneia*) of Christ to the Magi.
Epiphytes [epifits]. Plants which grow upon other plants, but are not fed by them.
Epirus [epirus]. Anc. dist. of N. Greece along Ionian Sea.
Epping Forest, Essex. 10 sq. m. of wild woodland once part of a huge oak-

hornbeam forest; fallow deer and many other creatures run wild; bought by City of London in 1882; 3-298.

Epsilon, ε, E. Fifth letter (short o) of the Gk. alphabet.

Ep'som, Surrey. Borough 15 m. S.W. of London; pop. 68,019; mineral springs from which Ep'som salts were first obtained; famous racecourse where Derby and other races are held; 3-76, 4-198, 7-196.

Ep'som salts. Magnesium sulphate. White crystals, used as purgative, as a dressing for cotton goods, and in dyeing with aniline colours.

Epstein, Sir Jacob (b. 1880). Brit. sculptor, 3-294, 4-373; 6-523 illus. K.B.E. 1954.

Ep'worth. Vill. in Lincolnshire, birth-place of John Wesley; the chief Methodist publishing firm is called the Epworth Press.

Equation, in algebra, 1-106; chemical, 1-11, 2-322; in geometry, 3-518.

Equator. Imaginary line running round the earth midway between the Poles, approx. 24,902 m. long. Latitude is measured N. and S. from the equator. At the equinoxes, the sun is directly overhead at noon, 3-160; height of troposphere at, 1-80; and winds, 7-458 with illus.

Equatorial mounting, of telescope, 5-193.

Equilibrium. The state of balance. In chemistry, a state of equilibrium or balance is reached when, during a chemical reaction, the original substances are reacting at the same rate as the new substances are reacting with each other to form the original substances. Mechanical equilibrium is the state when a body is at rest or is moving with uniform velocity. A body in stable equilibrium will return to its original position after a slight displacement. In aeroplane, 1-37.

Equinox and Solstice, 3-294; and astronomy, 1-278; spring and autumn, 6-526.

Equinoxes, Precession of the. Effect of a slow conical movement of the earth's axis. At present it points towards the Pole Star (a *Ursae Majoris*); 4,500 yrs. ago it pointed to a *Draconis*; 12,000 yrs. hence it will point to Vega. Thus the celestial North Pole is not fixed but moves round in a small circle among the stars once in every 25,800 yrs. As a result the equinoxes come just over 20 min. earlier each year; 1-278, 279, 3-29; and Vega, 7-147; and zodiac, 7-524.

Equisetum. Genus of "horse tails," related to ferns.

Eras, Geological, 3-515, 516.

Erard, Sebastian (1752-1831). Fr. maker of musical instruments; perfected the harp and greatly improved the piano, 4-134.

Erasmia pulchella. Moth, 2-112 illus.

Erasmus, Desiderius (1466/1469). Dutch scholar and reformer, 3-295; as Renaissance scholar, 6-386; forerunner of Luther, 6-376; and Holbein, 4-185; and Sir Thos. More, 5-262; on schoolboys, 2-336.

Erato. In Gk. myth., Muse of love poetry, 6-299.

Eratosthenes [eratothenes]. of Alexandria (c. 275-204 B.C.). Gk. scientist, chief librarian of Alexandrian Library; calculated earth's circumference; first real maps, 3-511.

Erbil (Iraq). See *Arbels*.

Erbium (Er). Chem. element, at. no. 68; at. weight 167.2; 3-221.

Erekmann-Chatrain [erkmahn sha'train]. Signature of Fr. literary collaborator, Emile Erekmann (1822-99) and Louis Gratien (Charles Alexandre Chatrain (1828-90), writers of novels, short stories, dramas (*Madame T. T. et le L'Ami Fritz*).

Er'ebus. In classical myth., the dark space between the earth and Hades.
Erebus. Antarctic volcano, Ross Isl., in lat. 77° 30' S.; 13,000 ft.; 1-187

ERNEST AUGUSTUS

Erechtheion or Erechtheum. Anc. temple on the Acropolis, Athens, 1-13 illus., 4-73 illus. f.

Erechtheus [erekthos]. Legendary king of Athens, temple at Athens, 1-13.

Erfurt. City in E. Ger., 70 m. S.W. of Leipzig; pop. 168,700. In flower and vegetable-growing and seed-exporting region; formerly had famous university.

Erg. The unit of work or energy measured in the U.G.S. system. It is the work done by a force of one dyne through a distance of one centimetre.

Erg, El. Largest oasis in Sahara desert, 6-485.

Erie, or Little by Little. School story (1858) by Rev. E. W. Farrar, notorious for its "preaching," 2-356.

Erica (species of heath). See under *Heather and Heath*.

Eriasson, John (1803-80). Swedish American engineer; improved marine steam engine and (in 1861) built the first armoured turret ship, the *Monitor*, for the U.S. navy.

Eriasson, Lolf (11th cent. A.D.). Norse adventurer who discovered N. America, A.D. 1000. Having been sent by Olaf, King of Norway, to proclaim Christianity in Greenland, he was driven off course and landed probably on Nova Scotia, 1-132. He was the son of Erik the Red.

Eridu. Iraq; archaeological finds, 1-205 with illus.

Erie [er'i]. Pennsylvania, U.S.A. Lake port 88 m. S.W. of Buffalo, N.Y.; pop. 130,803; largest harbour on L. Erie; steam engines, large fishing interests, 6-119.

Erie, Lake. Shallowest and stormiest of the Great Lakes; a. 10,000 sq. m.; Detroit and other ports on its shores; battle fought in 1813; 5-429, 2-190, 4-68.

Erie Canal, N.Y., U.S.A. Completed in 1825; connecting Buffalo on Lake Erie with Troy on R. Hudson. length 340 m.; 4-60.

Erigena [erigena]. Johannes Scotus (c. 810-877). Philosopher and theologian, native of Ireland (Scotland). later branded as heretic; head, under Charles the Bald, of the palace school founded by Charlemagne.

Erik the Red (10th cent.). Norse hero, founded a colony in Greenland, calling the country Greenland to attract settlers, 1-220, 6-212.

Erlin [erlin]. Anc. name for Ireland now used poetically.

Erynys. See *Furies*.

Eris [eris]. In Gk. myth., goddess of discord, 7-320.

Eriskey. Small isl. in the Hebrides, Scot.; pop. 60. Here Charles Edward, the Young Pretender, landed from Fr., July 1745, to lead the Jacobite rebellion.

Erith. Tn. in Kent; pop. 46,263; engineering, chemical, cable and plastic works. Shipbuilding centre; 5-27.

Eritrea. Former Italian colony, now federated with Abyssinia; area about 16,100 sq. m.; pop. 1,088,000; cap. Asmara; 3-295, 1-8.

Eriwan [erivan]. Cap. and largest city of Armenia, S.S.R., 110 m. S. of Tbilisi; pop. 200,000; on caravan route Russia to Persia; 1-212.

Erl-king or Erlikönig. In Teutonic folklore, a malicious being who haunts the forest and carries away children; subject of poem by Goethe and song by Schubert.

Ermanaric (d. c. 375). King of Ostrogoths; the "Gothic Alexander"; founded a vast empire, 4-49.

Ermine. Fur, 3-295; and royal tradition, 3-496.

Ermine Street. Old Rom. road running from London to Colchester, thence to Lincoln and York, 6-456.

Erne, r., and two lochs (Upper and Lower) in Northern Ire.; the r. flows into Donegal Bay; length of r. and lakes together 60 m.; 8-346.

Ernest Augustus (1771-1851). King of Hanover, 5th son of George III of

EROICA SYMPHONY

Eng., succeeded to Hanoverian throne in 1837 (males alone being eligible), separating Eng. and Hanoverian crowns after personal union of over 100 years.

Eroica Symphony. Popular name of the symphony No. 3 in E flat by Beethoven (op. 55); completed in August 1803.

Eros. In Gk. myth., god of love and friendship; corresponds to the Rom. Cupid. *See* cupid and *psyche*.

Eros. Celebrated statue on the Shaftesbury memorial fountain, Piccadilly Circus, London, 5-26, 6-521 illus.; corrosion resistance, 1-128.

Errieth, Loch. Fresh-water loch in Inverness-shire and Perthshire, Scot.; length 15 m.; 4-275, 6-138.

Erse. Early Scottish variant of Irish, in 18th cent. it meant Gaelic speech, whether of Scot. or Ireland. Now sometimes used as name of the language sub-group which includes Manx and Gaelic, correct name for which is Goidelic.

Ervine, St. John Greer (b. 1883). Brit. playwright and dramatic critic, also wrote novels and biographical studies; plays include *Jane (1911)*; *The First Mrs. Fraser* (1928); *Anthony and Anna* (1935).

Erymanthian boar. In Gk. myth., slain by Hercules, 4 166.

Erythra. In Gk. myth., bl. beyond Strait of Gibraltar, home of monster Geryon.

Erythrocytes, red corpuscles; in blood stream, 1-489.

Erzberg. Mt. in Styria, Austria; mining centre; iron workings, 1 323 illus.

Erzberger [arts' barger], **Matthias** (1875-1921). Leader of Democratic Catholic party in Ger. Reichstag; sec. of state (1918); negotiated armistice terms ending 1st World War; minister of finance (1919); assassinated.

Erzerum [az'room] or **Erzurum.** Ancient city of Asiatic Turkey (pop. 52,500), and cap. of vilayet of same name (pop. 371,400); copper and iron mines; capture by Russians in 1st World War (Feb. 1916) ended projected Turkish invasion of Egypt. The name means "the fortress of Rome"; it was the chief fortress of the north-eastern frontier of the Roman Empire.

Erzgebirge (Ore Mts.), on boundary between Land of Saxony and Czechoslovakia, 6 503; mineral deposits, 3 22 with map.

Erzincan. Tn. in Asiatic Turkey; silk and cotton mfrs.; earthquake (1939), 3-153.

Erzurum. *See* Erzurum.

Esarhaddon [es'arhad'on] (d. 688 B.C.), king of Assyria (680-668 B.C.); son of Sennacherib and father of Assurbanipal; brought Egypt under Assyrian rule, rebuilt Babylon; enlarged Assyrian Empire; 5-110.

Esau [es'au]. Son of Isaac and Rebekah and elder twin brother of Jacob; hairy hunter who sold his birthright to his brother for a mess of pottage and was cheated by the wily Jacob (Gen. xxv, xxvii); founds Edomites, 4-373.

Esbjerg [es'byarg], Denmark. Spt. on w. coast of Jutland; pop. 43,240; submarine cable connects with Calais; 3-74.

Escalator. Type of lift, 4-497 with illus.

Escallibur. *See* Excalibur.

Escanaba. Tn. in Michigan, U.S.A.; pop. 15,170; 5-192.

Escapement. Device, invented in 18th cent., for converting circular motion into reciprocating (up and down or back-and-forward) motion; in clocks, 2-413, 414.

Escarpment. In geology, the steep face of a cliff, usually caused by erosion or by prehistoric changes in water line.

Escaut (river). *See* Scheldt.

Escurial, The. Royal and religious buildings, nr. Madrid, Spain; built 1563-84 by Philip II; 7-114 illus.

Esqudo. *See* Money (table).

Esdraelon [ezdrae'on]. Plain of. The greatest plain of Palestine; fertile, level, roughly triangular, bounded by Mt. Carmel on w., Mt. Gilboa on s.e., highlands of Galilee on n.; scene of many battles in all ages.

Esk. R. in Middlethian, Scot., flowing into the Firth of Forth at Musselburgh, 5-40.

Esk. r. of s. Scot., flowing into Solway Firth; length 35 m., 3-134.

Eskimo. Primitive people living along the shores of Labrador, N. coast of Amer., on Arctic Is., Greenland, and part of Siberian coast, 3-296; in Alaska, 1-90; in Arctic circle, 1-221; in Canada, 2-197; children, 2-352 illus.; diet, 3-409; fishing, 1-222 illus.; kayak, 1-501 illus.; lamps, 4-442; reindeer herds, 6-380.

Eskimo Dog. *See* Dogs (table).

Esen or Esneh. In Egypt. Tn. on left bank of Nile 27 m. s. of ruins of Thebes; trade post for caravans.

Esparto. A fibrous grass, native to s. Africa and s. Spain; long used for mats, baskets, rope, sandals; in paper making, 6 63, 69 illus., 70.

Esperanto. An artificial language, 3 296, 4 445.

Esquimaux. British Columbia, naval station on Vancouver Isl. about 3 m. w. of Victoria; pop. 3,000; large harbour, naval yards, fortifications; shipbuilding, salmon canning.

Esquimaux. *See* Eskimo.

Essay (Fr. *essai*, attempt). Literary composition, generally in prose, of a short and informal character. Origin of word is the same as assay, for at first it was taken as indicating a testing or trying of a subject; Addison and Steele, 1-16, 7 151, 3 247; Bacon's essays, 1-310; Lamb, 4-440, 2-195, 3-290; Montaigne, 5-218.

Essay on Criticism (1711). Poem by Alexander Pope, 6-259.

Essen. City of W. Ger., in the Land of North Rhine-Westphalia; pop. about 500,000; 3-296; industries, 4-1, 5, 6 468.

Essential oils, 5 506; in perfume, 6-123.

Essequibo [es'ekwib]. Largest r. of Brit. Guiana, S. Amer.; 600 m. long; flows into Atlantic by estuary 20 m. wide.

Essex, Robert Devereux, 2nd Earl of (1566-1601). Eng. soldier and courtier; won distinction in war with Sp.; later fell into disfavour, tried to incite insurrection, was executed for treason; and Elizabeth I, 3-232; and Bacon, 1-340.

Essex, Robert Devereux, 3rd Earl of (1591-1646). Eng. general, son of preceding; commander of Parliamentary forces 1642-5 in Civil War.

Essex. Eng. co.; area 1,530 sq. m.; pop. 2,013,574; co. tn. Chelmsford; 3-298.

Es'ling. Vil. in Lower Austria, 7 m. E. of Vienna; between it and Aspern occurred bloody battle between French and Austrians in 1809.

Estate agency, employment in, 2-236.

Estate management, careers in, 2-236.

Estates-General, The. In pre-Revolutionary Fr. a representative assembly of nobles, clergy and people, 3-452; first meeting, 6-155; in Fr. revolution, 3-467; Mirabeau and Third Estate, 5-224.

Este (es'ta), House of. Old illustrious family of Italy, capital at Ferrara; famous for political importance and splendid court; encouraged poets, painters and scholars; Alberto Azzo II (11th cent.) was common ancestor both of House of Este and of House of Guelf, from which British royal family descends.

Este, Alfonso (II) d', duke of Ferrara (1486-1534), marriage to Lucrezia Borgia, 2-18.

Ester. Class of substances formed by the reaction of an alcohol plus an acid accompanied by the elimination of water; many are found in plants, some giving rise to their scents; ester gums, 6-389.

ETIQUETTE

Esterhazy, Prince Paul Anton (d. 1762), and Haydn, 4-142.

Ether. Heroine of Old Testament book; adopted daughter of a Jewish exile; became consort of Persian king; frustrated plots against Jews.

Estonia. Repub. of U.S.S.R.; a. 17,610 sq. m.; pop. 1,120,000, cap. Tallinn, 3-298 6-477, 7-483.

Estremadura [estremad'ura]. Prov. of Portugal, in which Lisbon lies.

Eta [e'ta], 7, II. Seventh letter (long e) of Gk. alphabet.

Eth. Greenland. Eskimo settlement on Smith Sound; most northerly vil. in world.

Etapes. Tn., fishing port and resort of Fr., in dept. of Pas-de-Calais, 17 m. s. of Boulogne. Pop. 6,500. Large Brit. war cemetery.

Etching. 3-299; by Goya, 4-53 illus. on glass 4 120.

Ethemiadzin [echm'e'adzin] or **Ehmiadzin.** Vil. and convent in Armenia, 15 m. w. of Erivan, residence of the Catholics, or head of the Armenian Church.

Eteocles. In Gk. myth. son of Oedipus and brother of Antigone, 5-505.

Etesian winds. Prevailing northerly winds blowing in Mediterranean regions in summer; and Sahara desert, 2 409.

Ethandune, Battle of (878). Danes defeated by Alfred, 1-103.

Ethane. Colourless gas; in natural gas, 5 331.

Ethelbald or Æthelbald. King of Wessex, A.D. 858-860.

Ethelbert or Æthelbert (c. 552-616). King of Kent, betwixt and over lord of all the English s. of the Humber, and author of the first written Eng. laws; 4 394; converted by St. Augustine, 1 408.

Etheldreda, St. (c. 640-679). Eng. saint, often called St. Audrey, Abbess of Ely. Ely oath, marks the site of her grave.

Ethelfleda or Æthelfleda (d. A.D. 918). Eldest daughter of Alfred the Great, wife of the Earl of Mercia.

Ethelred or Æthelred. King of Wessex and Kent 866-871, brother of Alfred the Great.

Ethelred (c. 968-1016). King of the English from 978; surnamed the Unready or the Redeless, from his inability to discern good rede or advice. Instituted the Danelaw. Ordered a massacre of the Danes on St. Brice's day, Nov. 12, 1002. Tried to further invasions, and ultimately to the recognition of Sweyn, King of Denmark, as King of Eng. Ethelred fled to Normandy, but returned after Sweyn's death; and Edward the Martyr, 3-166.

Ethelwulf or Æthelwulf. King of Wessex, 839-858. Father of Alfred the Great.

Ether. Volatile liquid, sometimes used as anaesthetic, 3-302, 5-165, 1-112 7 191.

Ether. Medium supposed to pervade space, 3-301, 6-380.

Etherege, Sir George (1631-91). Eng. dramatist, originator of the modern comedy of social life, 3-286.

Ethical idealists. A school of philosophers, 6-159.

Ethics. A branch of philosophy dealing with morals, 6-159; Aristotle and, 1-228.

Ethiopia. *See* Abyssinia.

Ethiopian dollar. *See* Money (table).

Ethnology. Study of national character, development, and social life in the different groups of mankind, 6-343.

Ethyl alcohol, formula, 1 96; mode of organic molecule, 2-320 illus.

Ethyl chloride. An anaesthetic resembling in its effects both nitrous oxide and ether; also used as a "local" anaesthetic for freezing to skin, 1-143.

Ethylene. Gas; structure and formula 2-319; as inhalation anaesthetic 1-143; model of organic molecule 2-320 illus.

Etiquette, 3-302; origin of hat-raising 4-137; table manners in Elizabethan times, 4-420, 5-152.

ETNA

Etna, Mount. Volcano in Sicily; 10,750 ft.; 3-303 with illus.

Roche de Hollande. Variety of rose, 6-452 illus. f.

Eton College. Famous Eng. public school; founded in 1441 by Henry VI.; greatest sporting event is cricket match against Harrow; 3-304, 6-503; fives, 3-385; arms of, 4-163 illus. f.; old print of, 4-67 illus.

Eturia (Etruria). Anc. country s.w. of Rome, inhabited by Etruscans.

Etruscans. Anc. people of Italy, 3-305, struggles with Rome, 6-430; rule in Rome, 6-429; gladiatorial shows, 4-26.

Ettrick, Scot. Mt. on borders of Selkirkshire and Dumfriesshire; 2,269 ft.

Ettrick Forest. Dist. of Selkirkshire, Scot., almost treeless; formerly part of Caledonian Forest which was a royal hunting ground, 6-531.

Ettrick Water. r. of Scot., rises in Ettrick Pen and flows 32 m. N.E. to the Tweed, 6-531.

Ettv, William (1787-1849); Reckoned greatest Brit. painter of the nude; attended life-classes at R.A. schools till the end of his life; 3-264.

Etymology. Study of the origin and meaning of words; definition and examples, 6-158.

Euboea (u bē'ā). Largest isl. in Greek archipelago; 90 m. long, 4 to 30 m. wide; pop. 179,500; chief tn. Chalcis; minerals, oil, wine, farm products.

Eucaine (ū'kūn). A local anaesthetic used in place of cocaine than which it is less dangerous.

Eucalyptus. Tree, 3-305; in Australia, 1-312; protection of leaves against evaporation, 3-319.

Eucalyptus oil, source and uses, 3-306.

Eucharist (ū'karist), or Communion. Chief sacrament of the Christian Church; it consists of partaking of the consecrated elements—the bread and the wine, representing the Body and Blood of Christ.

Euchloron mogera. Moth, 2-143 illus.

Eucken (ū'ken), Rudolf Christoph (1846-1926). Ger. idealistic philosopher; urged the "application of a vital religious inspiration to the practical problems of society"; winner of Nobel prize for literature (1908), 6-160.

Eucrase. A rare mineral resembling aquamarine; a beryllium aluminium silicate, occurs in Urals and Brazil; colourless, or bluish or yellowish; sometimes cut as a gem.

Euclid (ū'klid) (c. 300 B.C.). Gk. mathematician, called "father of geometry" (*Elements of Geometry* long used as school text-book), 3-518.

Eudox'ia (c. 393-460). Rom. empress; the daughter of Theodosius II, and wife of Valentinian III.

Euergetes I (ē'getēs). See Ptolemy III.

Eugene (ā'hū'n) of Savoy, Prince (1663-1736). Fr.-born Austrian general and statesman, one of great captains of history; defeated Turks at Zenta (1697), helped Marlborough to win at Blenheim and Malplouquet; took Belgrade from Turks (1717), 2-28; at Blenheim, 1-184.

Eugenics. Science of breeding, esp. human beings. See also Heredity, Mendelian law.

Eugenie (ē'hūnē), Empress (1826-1920). Wife of Napoleon III, emperor of the French.

Eugenol. Colourless liquid, chief constituent of oil of cloves. Strong antiseptic, preventing mould growth. Used by dentists as a dressing, and mixed with zinc oxide as a temporary filling.

Eulenspiegel (ō'lenšpēgel), Till. or **Till Owlglass,** hero of a 16th cent. German collection of jests and practical jokes; published by a Brunswick monk, Thomas Murner. Owlglass is supposed to have been an actual person who died in 1550. First trans. into English in 1560. Richard Strauss made Eulenspiegel the subject of a brilliant symphonic poem.

Eumenides. See Furies.

Eupatrides. Hereditary aristocrats of anc. Greece.

Eupen (ō'pen). Tn. and dist. in E. Belgium 20 m. E. of Liège; ceded with Malmédy by Ger. in 1919.

Euphonium. See Tuba.

Euphrates, r. of s.w. Asia, chiefly Iraq; 1,700 m.; with i. Tigris formed the fertile plain known as Mesopotamia, 3-306, 4-278; and Babylon, 1-335; map, 7-333.

Euphrosyne (frow'luē). In Gk. myth., one of the three Graces.

Euphuism. Affected style of language used in Lyly's *Euphues*, 3-281.

Eura'sians. Term used in India to designate people of mixed native and European extraction; also used of other persons born of mixed European and Asiatic blood.

Eure. Tributary of r. Seine, Fr., length 70 m., 6-530.

Eureka (Gk. I have found it). Famous exclamation of Archimedes on discovering a principle of hydrostatics, 1-208.

Eurhythmics. Art of expressing harmony of music by gestures. Invented by Emile Jaques-Dalcroze (1865-1950); 3-307.

Euripides (ū'ōp ē'pēs). Gk. dramatist, 3-307, 3-116; Aristophanes, 1-227.

Euro pa, in Gk. myth., daughter of a Phoenician king and sister of Cadmus; carried off to Crete by Zeus in form of a bull.

EUROPEAN HISTORY

Europe. Continent, really a peninsula w. of Asia; area about 4,000,000 sq. m.; pop. over 500,000,000; 3-308; map f., 3-308; physical features, 3-308-311; canals, 2-205; climatic factors, 3-308; climatic divisions, 3-312; archaeology, 1-201, 6-308; 3-378, 5-461; types of forest, 2-120; importance of the Gulf Stream, 4-103; ice age, 4-228; mountains, 1-120, 1-180, 1-310, 2-245, 2-251, 6-013, 7-280, 6-469; rainfall, 6-360; effect of World Wars and food supply, 3-112; trade with Asia, 1-270, 271; dances, 3-37; eclipses in, 4-109; see also articles on countries, chief cities, mountains and rivers.

European Assembly. Name given to Consultative Assembly of the Council of Europe (q.v.).

European History, 3-313; prehistoric period 2-282, 2-73; lake dwellers, 4-139; the beginnings of European civilization, 1-22; influence of Cretan culture, 1-21; ancient Greece and the city states, 4-71, 1-287, 3-70, 3-408, 7-123, 7-320, 1-209, 1-278, 2-180, 3-115; the Phoenicians, 6-160, 3-511; Carthage, 1-52; Alexander the Great and his empire, 1-98; the Supremacy of Rome, 6-129, map 6-133, Punic Wars, 2-255, 4-127; invasions of the Goths, 4-48, 4-3; invasions of Attila, 4-208, 1-306; Byzantine empire, 2-148; the spread of Mohammedanism, 5-87, 6-131, 5-260; invasions of the Vikings, 5-418, 5-204, 3-314; Charlemagne's empire, 2-305; Holy Roman empire, 4-187, 3-314; feudal system, 3-318, 5-200, 4-417; Crusades, 3-1; Middle Ages, 5-198; Flanders, 3-387; army organization, 1-247; Renaissance, 6-384; Hundred Years' War, 4-203, 4-376, 3-450, 1-68, 4-163; the fall of Constantinople, 2-149; exploration and discovery, 2-167, 2-156, 5-77, 6-255; the Hapsburg empire, 4-129; the Reformation, 6-376; Thirty Years' War, 7-269, 4-8; Seven Years' War, 7-2; partition of Poland, 6-240; Industrial revolution, 4-259, 2-353; Fr. Revolution and Napoleon, 3-466, 5-43, 6-111, 4-334, 3-315, 6-318; Peninsular War, 6-116; unification of Italy, 3-314, 5-151, 3-504, 6-499; the rise of Prussia, 6-298; Crimean War, 2-532, 1-318; Balkan Wars and the Eastern Question, 7-335; 1st World War, 7-478; years between the two World Wars, 7-183; League of Nations, 4-463; rise of dictatorships, 4-181, 7-141, 6-476, 5-310, 4-316, 3-311; 2nd World War, 7-186; United Nations, 7-351; N.A.T.O., 5-157. See also topics above and countries, listed in the table below, by name.

AREA AND POPULATION OF EUROPEAN COUNTRIES

COUNTRY	AREA sq. m.	POPULATION	COUNTRY	AREA sq. m.	POPULATION
Russia (European)	2,363,000	169,255,000	Irish Republic	26,000	2,950,000
France	212,737	40,503,000	Denmark	16,675	4,231,000
Spain	190,205	27,977,000	Switzerland	16,000	4,715,000
Sweden	178,300	7,047,000	Netherlands	15,600	10,250,000
Germany, West	138,000	49,000,000	Belgium	11,800	8,625,000
Norway	125,000	3,341,000	Albania	10,700	1,150,000
Poland	120,353	25,500,000	Turkey	8,100	1,626,000
Finland	117,914	4,083,000	Wales	7,500	2,597,000
Italy	116,000	46,738,000	Northern Ireland	5,200	1,371,000
Yugoslavia	99,000	15,772,000	Cyprus	3,600	450,000
Rumania	88,700	15,873,000	Luxemburg	~1,000	299,000
Greece	51,168	7,990,000	Man, Isle of	221	55,000
England	50,437	41,573,000	Andorra	191	5,000
Czechoslovakia	49,110	12,400,000	Malta (with Gozo)	122	307,000
Bulgaria	42,798	7,000,000	Channel Islands	75	103,000
Germany, East	41,000	17,500,000	Liechtenstein	60	14,000
Iceland	39,700	144,000	San Marino	88	12,000
Hungary	35,902	9,205,000	Monaco	2	20,000
Portugal	35,500	8,491,000	Gibraltar	2	23,000
Austria	32,400	6,919,000	Vatican	~17	1,000
Scotland	~ 29,800	5,096,000			

EUROPEAN PAYMENTS

European Payments Union, 3-119.
European Recovery Programme (E.R.P.), U.S. plan evolved in 1947, also called "Marshall Aid," 7-354, 5-137.
Europerforms. Division of human species, 6-333, 335 illus.
Europlum (Eu). Chem. element; at. no. 63; at. weight 152.0; 3-224.
Eurovision. Internat. television network, 7-253, 254.
Eurus (ŭr'us), in Gk. myth., east wind.
Eurydice (ŭr'ĭd'ĭs), in Gk. myth., wife of Orpheus; killed by serpent's bite, rescued from the underworld by Orpheus, but lost again; 6 6.
Eurylochus. In Gk. myth., companion of Odysseus; and Circe, 2 402.
Eurytheus. In Gk. myth., King of Thyrus; and Hercules and the 12 labours, 4-165.
Eusebia militaris. Moth, 2-143 illus.
Eusebius, Laurence (1888-1730). Eng. scholar; poet laureate (1718-30), 6-232.
Eusebius (ŭs'eb'ius) of Caesarea, called Pamphil (c. 264-340). Christian theologian, most learned man of his age; *History of the Christian Church*, by far the most important record of the Church; chief figure at Council of Nicea.
Eusebius of Nicomedia, called "the Great" (d. c.A.D. 341). Theologian, leading defender of Arius, and after death of Arius leader of his party; Bishop of Nicomedia and Constantinople.
Eustachian tube. In anatomy; and ear, 3-147 with diag.
Eustachius (ŭstāk'ius) (Bartolomeo Eustachio (d. 1574). Ital. anatomist, physician to Pope Sixtus V; investigated structure of ear, heart, kidneys, teeth, muscles of head and neck, and other parts of body; gave his name to Eustachian tube of ear, 3-147.
Eustera brachyura. Moth, 2 113 illus.
Euston. London rly. terminus for the midland and north-west, named after the ground landlords, the earls of Euston; was opened Jan. 1, 1838.
Eutectic. In metallurgy, 1-115 with illus.
Euterpe. In Gk. myth., Muse of lyric poetry, 5-299.
Euthanasia. Easy death advocated by some for those suffering from incurable and painful disease.
Euwe, Dr. Max (b. 1901). Dutch chess player, world champion (1935-37), 3-328.
Euxine Sea. See Black Sea.
Euzkadi [kooth'kād'i]. The Basque country in the N.E. corner of Spain, including the provinces of Vizcaya, Guipuzcoa, Alava, and Navarre; of these all but the last-named were under an autonomous govt., ratified by the Sp. Republican Govt. in Oct. 1936; a. 6,795 sq. m.; est. pop. 1,350,000; conquered by the insurgent forces in the Civil War of 1936.
Evangelicalism. In Free Churches, 3-464.
Evans, Sir Arthur John (1851-1911). Brit. archaeologist; excavated Minotaur palace of Knossos, Crete, 1-25 1-203.
Evans, Canados (1879-1945). Welsh novelist (*My People*, and play *Taffy*) 7-415.
Evans, Petty-officer Edgar. One of heroic party of five who accompanied Capt. Scott in Antarctic and died on tragic journey from the South Pole 6-317.
Evans, Dame Edith (b. 1898). Brit. actress; first appearance 1912; brilliant characterisations incl. the Nurse from *Romeo and Juliet*, Millamant, Lady Bracknell; has also appeared in films. D.B.E., 1945.
Evans, Edward Ratcliffe Garth Russell. Brit. naval officer, second-in-command on Capt. Scott's last polar expedition, known as "Evans of the Broke." See Mountevans.
Evans, Mary Ann or Marian. See Elliot, George.
Evaporated milk, 5-206.
Evaporation, 3-319; and distilled water, 3-93.

Evatt, Herbert Vere (b. 1894). Australian politician; attorney-gen. and min. for External Affairs in 1941; in 1946 dep. prime min. of Australia; chairman of U.N. gen. assembly, Paris, in 1948.
Eve. In Bible, the first woman, 1-15.
Evelyn, John (1620-1706). Eng. writer and diarist, 3-319, 3-287; and Grinling Gibbons, 4-19.
Evening classes, variety of subjects, 6-306.
Evening primrose. A flowering plant with yellow flowers that open in evening only; genus *Oenothera* of fam. *Onagraceae*.
Evening Star. Usually Venus, first planet visible after sunset; occasionally Mars, Jupiter, or Saturn.
Evensong. Service of the Evg. Book of Common Prayer. Drawn up 1549, revised 1552 and 1662. The prescribed evening service of the Church of Eng.
Everest, Sir George (1790-1866). Brit. surveyor and geographer; superintended first survey of India; located Mt. Everest, 3 310.
Everest, Mt.. In Himalayas on borders of Nepal and Tibet; height 29,002 ft., the loftiest mt. in the world; summit reached in 1953, after many unsuccessful expeditions; 3-319, 1-264; air pressure at top, 1 80; route to summit, 3-320 illus.; view from Rongbuk monastery, Tibet, 7-274 illus. f.
Everglades, The. Marshlands and swamp forests in Florida, U.S.A., 3-393.
Evergreen beech, forests, 3-421.
Evergreens. Plants whose leaves last several years and are not shed simultaneously, thus the plants are never leafless; shedding of leaves, 4-172; modification of growth in cold climates, 6 217.
Everlasting Flowers or Immortelles. Term applied to the flower-heads of certain composite plants, notably *Helichrysum* and *Rhodanthe*. Gathered before fully expanded and hung head downwards to dry, the parchment-like flowers retain form and colour for years.
Everlasting Mercy, The. Poem by John Masfield, 5 141.
Everlasting pea. A variety of pea, 6-99.
Everton. Suburb of Liverpool, Eng. Famous for its toffee, and for its Association football club, founded 1878, one of the twelve original clubs of the Football League, 1888.
Everyman. Eng. morality play of late 15th cent., telling the story of Everyman who is summoned on his last journey by Death, and his attempts to find a companion to go with him.
Evesham. Market tn. in Worcs, Eng., on r. Avon in the vale of Evesham; pop. 12,066; centre of fruit-growing area and especially asparagus; battle of Evesham (1265), 4-162, 5-232.
Evil eye, and use of charms, 5-78.
Evolution. Process whereby, according to the theory of evolution, one kind of living creature gives rise to another kind, usually an improved species which persists alongside of, or in place of, the original stock, 3-321; Darwin's theory of, 1-155, 3-51; beginnings of life on earth, 3 149, 151; apes and man, 1-179; Australian animals and plants, 1-312; evolution of elephant, 3-227; embryology, 3-241; evolution of horse, 4-196, 1-156 illus.; evidence from fossils, 3-425; prehistoric animals, 6-281; reptiles, 6-388. See also Heredity.
Evora (ev'or-ă). The cap. of the dist. of Evora, Portugal; dist. is hilly, and forms the basin of a number of small streams that flow into the r. Guadiana; cork oak forests relieve the barrenness of the region.
Ev'zones. Gk. light troops whose uniform is a white kilt or *fustanella*, wide sleeved white shirt, red-pointed shoes, and blue-tasseled red cap.
Ewald (ä'vahl't), Johannes (1743-81). Denmark's greatest lyric poet, first

EXOCARP

used in imaginative writing the anc. history and mythology of Scandinavia; *Rolf Krage*, first original Danish tragedy; *Baldur's Death*, an heroic opera; *The Fishers*, which contains the Danish national song, a lyrical drama.
Ewe. A female sheep, 7-20.
Ewe, Loch, Ross and Cromarty, Scot., 6-455.
Ewing, Juliana Horatia Orr (1841-85). Brit. writer of books for children; simple in style, quiet humour; *The Story of a Short Life and Jackanapes* are the most popular. Many of her books were illustrated by Kate Greenaway and Randolph Caldecott.
Ew'ins, Arthur J. (b. 1882). Brit. chemist; with Dr. M. Phillips discovered the sulphur-drug M & B 693 in 1932.
Examination, 3-324.
Excalibur. King Arthur's sword; Sir Bedivere and, 6 458; supposed spot where thrown, 2 508.
Excavation, archaeological, technique, 1 204.
Excavators. Machines for removing soil, 3 325; rotary excavator for tunnelling, 7 326.
Excelsior. Poem by Longfellow parody of, 5 34.
Excelsior diamond, 3 85.
Exchange, Foreign. See Foreign Exchange.
Exchange control. In finance, 3-119.
Exchequer (ek'shek'ŭr), Chancellor of the. In Gt. Brit. the actual head of the Treasury and the official charged with the preparation of the Budget; he must be a member of the House of Commons and holds a portfolio in the Cabinet.
Exchequer, Court of. A division of the Eng. High Court of Justice.
Excise. See Customs and Excise.
Exclamation mark, in punctuation, 6 309.
Excommunication. Expulsion from the Church, 2 380.
Ex dividend. See Stock Exchange Terms.
Exe, r. of Somerset and Devon, flowing to Eng. Channel; 5 444, long, 2 88 7 84.
Execution, methods of, 6 290.
Executors. One or more persons named in a will to see that the testator's wishes are carried out, 7 450.
Exercise, and hygiene, 4 223; physical education, 6-183.
Exeter, Thomas Cecil, Earl of (1512-1623). Elder son of William Cecil Lord Burghley, 2-285.
Exeter. Co. tn. of Devon, Eng., pop. 75,479; 3 326; historical importance 3-82; Guildhall, 3-326 illus.
Exeter, H.M.S. Brit. cruiser sunk by Japanese, March 1, 1942, after the battle of the Java Sea, took part in the battle of the r. Platte. See Platte River, Battle of.
Exeter College, Oxford Univ., 6-17, arms, 4 165 illus. f.
Exeter University, 3-326, 7-368.
Exhibitions, 3 326.
Existentialism. Philosophy of existence, primarily concerned with the nature and experience of the individual. Preoccupied with the nature of being or essence, with individual human consciousness coming into a world of existences and, above all with action. Derived partly from Kierkegaard, whose dictum, "Choose life and be free," was interpreted by the philosophers Heidegger and Jaspers in the light of a nihilistic doctrine. Influenced post-war literature, e.g. Sartre, Camus.
Ex libris, on a bookplate, 2-12.
Exmoor. Moorland and forest expanse bordering Somerset and Devon, became National Park in 1954; made familiar by Blackmore's *Lorna Doone*; highest point Dunkery Beacon, 1,70 ft. 3-248, 7-84, 85 illus.
Exmoor sheep, 7-22.
Ex'mouth, Edward Pellew, 1st Viscount (1757-1833). Brit. admiral; bombardment of Algiers, 1-110.
Exocarp. Fleecy portion of a stone or drupaceous fruit, 3-480.

EXODUS

Exodus (Gk. "going forth" or "departure"). 2nd book of the Old Testament and Pentateuch; describes the giving of the divine law; opens with the account of Moses leading Israelites out of Egypt.

Exopterygota. In zoology, a division of the class *Insecta*, 4-270.

Exploits. Longest r. (150 m.) in Newfoundland; flows into bay on N.E. coast; 5-394.

Exploration and discovery: effect on world geography, 1-169, 3-514; Marco Polo's travels, 6-255; Columbus and Amer., 2-167; Cabot's voyages, 2-156; Magellan and Pacific sailing route, 5-77; in Canada, 2-119, 200; in Arabia, 1-195; first Atlantic routes, 1-135 map; and source of the Nile, 5-440; Capt. Cook's voyages, 2-494; polar exploration, 6-242, 7-10, 6-515, 6-245, 6-103, 1-220.

Explosives, 3-328; nitrogen compounds, 5-413; fulminating silver, 7-56; atomic explosions, 3-357; rocket, 6-421; used in quarrying, 6-320.

Exporting and importing, careers in, 2-236.

Exposure, in photography, 6-171.

Expressionism. Art movement in Germany, 19th 20th cent., opposition to Impressionism; led by Oscar Kokoschka (b. 1886) in Vienna and

Max Pechstein (b. 1881) in Berlin; less concerned with pictorial possibilities than with dramatic and romantic implications.

Extradition. The surrender by a govt. of fugitives from justice to the authorities of the country where the crime was committed.

Extra-territorial rights. The privilege accorded by international law to foreign sovereigns and diplomatic representatives of freedom from compliance with the laws of the country in which they are stopping. By special treaty citizens of European powers have at times had similar rights in African and Asiatic countries; renounced in China 1912-47, 2-373.

Extroverts. In psychology, 4-386.

Eyas or eyases. In hawking, a young hawk, 4-111.

Eyck, Jan and Hubert van. See Van Eyck.

Eye. Organ of sight, 3-331; of birds, 1-454; and visual centre of brain, 2-41; of cat, 2-261; chameleon, 2-301; colour vision, 2-163, 404; dolls' eyes, 3-104; first aid for, 3-368, of insect, 4-264; lens, 4-450; optics, 5-322; spectacles, 7-126; and television, 7-251; vitamin A and, 7-104.

Eyebright. Parasitic plant; food, 5-141.

FALIERO

Eye-brows, purpose of, 4-117.

Eyed Hawk Moth, 2-143 illus.

Eyelashes, purpose of, 4-117.

Eyelids, in Monocilliforms, 6-333.

Eye splices. Method of forming a loop at end of a rope, 4-423.

Eyot [ät], or **alt.** Term applied to a small island, especially one in inland waters.

Eyre, Edward John (1815-1901), Brit. colonial governor and explorer of Australia; discovered Lake Eyre, 6-322.



Eyre, "Lake." Salt marsh in South Australia, 1,000 sq. m.; a lake in wet seasons. Discovered by E. J. Eyre in 1840, 6-322, 7-102.

Eyston [E'ston], **George Edward Thomas** (b. 1897), British racing motorist; reached 357.53 m.p.h. in Utah, Sept. 1938. This record was later beaten by John Cobb.

Ezekiel [ez'ek'iel] (Hebrew, "God will strengthen"), one of major Hebrew prophets (author of 24th book of Old Testament), who was carried prisoner to Babylonia in 597 B.C. and flourished about 592-570 B.C., 6-296.

Ezra, "the Scribe," Hebrew priest and reformer (books of Ezra and Nehemiah); sent to Palestine in 458 B.C. by Artaxerxes to investigate conditions of Jews; brought back observance of Mosaic law.

F

THE letter F looks so much like E that some have thought it developed from the same form, but such is not the case. Long ago it was the Egyptian cerastes or horned asp. The two bars are survivals of the two horns of this poisonous viper, while the vertical stroke represents the body. Written in a running hand it became  and then the Phoenician , which was called *awu* or *vau*, meaning a "hook" or "peg." The

pronunciation then resembled that of our *w* or *v*. The Greeks wrote it much like our Y and called it *digamma* from its fancied resemblance to two united gammas of G's, one above the other. It is not found in the modern Greek alphabet, for after a time it dropped out of general use. The western Greeks continued to use it for some time, and the Romans adopted it, giving it the form which we now use. The Romans also gave it its present sound.

Faber, Frederick William (1814-63), British theologian and hymn writer, *G'd, Hark, hark, my soul; Sweet Saviour bless us ere we go.*

Fabian Society. Brit. socialist organization founded 1884. Policy of its founders was to bring about socialism in the U.K. by gradual, peaceful means; society named after the Roman general Fabius Maximus (Cunctator) whose tactics were: "For the right moment you must wait, but when the time comes you must strike hard"; 4-127; the Webbs and, 7-81.

Fabius Maximus, Quintus (d. 203 B.C., nicknamed Cunctator), Roman general; and Hannibal, 4-127.

Fables. Usually stories in which animals are given the power of speech, and a moral is pointed; of Aesop, 1-45, 46; of La Fontaine, 4-137.

Fabliaux [fab'liô]. Medieval tales, forerunners of the novel.

Fabre, Jean Henri Casimir (1823-1915), Fr. entomologist, 3-335; field of work, 6-337.

Facade, in architecture, the front elevation or face of a building.

Factors in mathematics, 3-335.

Fading. Of textiles; non-actinic glass prevents, 4-32.

Faenza [fab'en'ea]. It. city 19 m. s.w. of Ravenna; 15th-cent. cathedral; noted "faience" pottery.

Faerie Queens. The. Allegorical poem by Edmund Spenser, 7-130.

Faes, Peter van der. See Lely, Sir Peter.

Fagaceae [fag'seë], the beech family of trees.

Fahrenheit [fah'renh'it], Gabriel Daniel, (1686-1736), Ger. physicist and instrument maker; devised Fahrenheit scale for thermometers, 7-267.

Faience. A variety of majolica ware made in Fr., 6-277.

Fainting, first aid for 3-368.

Fair, 3-336; and circuses, 2-101.

Fairbairn, Sir William (1789-1874), British engineer and inventor; a pioneer builder of iron ships in Gt. Brit.; with Robert Stephenson, built tubular bridge over Menai Strait.

Fairbanks, Alaska, on Tanana r., largest gold-mining tn. in Interior; pop. 5,625; 1-90, 91.

Fairbridge Schools. Farm-training schools in Australia, S. Africa, and Canada; the first at Pinjarra, Australia, started in 1913 by Kingsley Fairbridge to help emigration of underprivileged children of the U.K.; voluntary finances helped by U.K. govt. and Commonwealth grants.

Fairey, Sir (Charles) Richard (b. 1887), Brit. aircraft designer and yachtsman; Pres. Royal Aeronautical Soc. (1930-31; 1932-33); awarded Wakefield gold medal for wing flap invention; knighted, 1912.

Fairey Delta II, jet fighter aircraft, illus. 4-368.

Fairfax, Thomas, 3rd Baron (1612-71), Eng. Parliamentary general under Cromwell; victor at Naseby 1645; was appointed as one of the judges to try Charles I, 1648, but refused to sit. Resigned his command in 1650. In 1659-60 helped Monk to restore Charles II to the throne.

Fairfield. Mt. in Lake dist., Eng., 2,863 ft., 4-438.

Fair Head, headland (636 ft. high), on N. coast of Antrim, Northern Ireland.

Fairies, in folklore, 3-837.

Fair Isle. One of the Shetland Is., famous for bird observatory and knitted jumpers, 7-27.

Fairmount Park, Philadelphia, U.S.A., 6-154.

Fairway. Navigable part of a river or channel, kept free from obstruction. In golf, that part of the course between green and tee on which the grass is kept short.

Fairweather, Mt. Peak of the Rockies in Brit. Columbia, Canada (15,300 ft.), 2-80, 6-125.

Fairyland, supposed locations, 3-338.

Fairy-ring, 3-339, 338 illus.

Fairy tales, Hans Andersen's stories, 1-141; children's books, 2-351; Grimm brothers and folk-lore, 4-98, 3-405.

Fakenham. Small tn. in Norfolk, Eng., 5-448.

Fal, r. of Cornwall, Eng. Rises in Roche, flows 23 m. to the Eng. Channel at Falmouth.

Falaba. Tn. in Sierra Leone, W. Africa, 170 m. N.E. of Freetown. Market for hides, nuts, ivory and palm kernels. Pop. 7,100.

Falaise. Tn. of N.W. Fr. in the Calvados dept. William the Conqueror born here. Much of the tn. was destroyed in 2nd World War. Chief industries, tanning, dyeworks, cotton spinning; horse and cattle fairs. Pop. 5,600; 7-451 with illus.

Falange. The Spanish Fascist party led by General Franco since 1938.

Falashas. African people; in Abyssinia, 1-6.

Falconry. See Hawking.

Falerian wine. Alcoholic drink of anc. Rome. Light coloured, full flavoured, made from grapes grown on the Falerian field, in Campania, s. Italy. A modern wine from the same region is called Falerio.

Faliero [fah'leä'r'ö] or **Faller, Marino** (1279-1355), Doge of Venice (1354-55), conspired to make himself sovereign; executed; subject of dramas by Byron, Swinburne, etc.

FALKENHAYN

Falkenhayn, Erich von (1861-1922). Ger. general; Prussian minister of war, 1913; in 1914 became chief of general staff of Ger. army; after failure at Verdun, succeeded by von Hindenburg; defeat by Allenby, 1-112.

Falkenhorst, Nikolaus von (b. 1885). Ger. soldier; in 1910 c.-in-c. occupation forces of Norway; in 1911 commanded on N. sector of Itura, front; after reverses relieved of command; sentenced to death by Brit. war crimes court, Brunswick, Aug. 1916, but reprieved and imprisoned for life. Freed in 1933.

Falkirk (faw'kirk). Tn. in Stirlingshire, Scot., 17 m. E. of Glasgow; pop. 37,528; iron-founding, cattle market. Here Wallace was defeated in 1298 by Edward I, 6-512, 7-416; Highlanders under Charles Edward Stuart defeated English under Gen. Hawley, 1746, 7-158.

Falkland, Lucius Cary, 2nd Viscount (c. 1609-43). Eng. soldier and politician; at first he supported the Parliamentarians, then the Royalists; killed in battle at Newbury (1643); was a friend of Clarendon.

Falkland Islands. Brit. groups of isls. in S. Atlantic Ocean, with part of Antarctic continent; including S. Shetlands, S. Orkneys, S. Georgia, and Grahamland; 3 339, 1-169; naval battle in 1st World War, 7-480.

Fall. The part of a hoisting rope which hangs from a block or pulley, to which the power is applied; boat falls, the tackle on the davits by which a ship's boat is lowered.

Fall, The. The sin of Adam and Eve in eating the forbidden fruit, for which they were cast out of the Garden of Eden, 1-15.

Falla (fah'yah), **Manuel de** (1876-1916). Spanish composer; music in Sp. manner; *Pièces Espagnoles*; *Nights in Gardens of Spain*; music for ballet *The Three-Cornered Hat*, *Lore the Magician*.

Fallen arch, in foot, 3 414.

Fallow system. In agriculture, 1 77.

Fall River, Mass., U.S.A. City taking its name from the r. upon which it stands; important textile centre; 50 m. s.s.w. of Boston; pop. 111,963.

Falls of St. Antony, on Mississippi r., 5-223.

Falmouth, spt. and winter resort in Cornwall at mouth of r. Fal; pop. 17,000; Pendennis and St. Mawes castles.

False acacia or **Locust tree**, 1-8.

Falstaff, Sir John, genial, dissolute "fat knight," boon companion of wild Prince Hal in Shakespeare's *Henry IV* and comic butt in *The Merry Wives of Windsor*, 7-14.

Falster. Isl. of Denmark, to the S. of Zealand. Area 183 sq. m.; pop. 31,392. Low, marshy nr. coast; inland areas fertile; chief crops fruit and sugar beet; 3-72.

Famagusta. Spt. of Cyprus, on E. coast, 3 m. S. of Salamis. Pop. 17,600. Chiefly agricultural; wines are produced.

Family. In zoology and botany, a group formed of related genera and itself a subdivision of an order; 1-451, 1-155, 2-24.

Family life, influence of fire on, 3-357; in France, 3-316; marriage, 5-133; morals, 6-153.

Fan, 3-339; (8th cent. fans, 3-341 illus. f.; mechanical, 3-340).

Fangs, of snakes, 7-402.

Fan-light. See Architectural Terms.

Fanloch, Loch. L. in centre of Ross and Cromarty, Scot.; 6½ m. wide, 1 m. long; used under N. of Scot. hydro-electric scheme as reservoir for power stn. at Grudie Bridge, Strath Bran; 6-455.

Fanning Island, one of a group of British coral islands in Pacific near Equator.

Fan-tail. Variety of pigeon, 6-198.

Fanti. Negro people in Gold Coast, W. Africa, numbering approx. 1,000,000. Formerly practised cannibalism.

Their language is Tshi, one of the principal Gold Coast tongues.

Fantin-Latour, Ignace Henri Jean Theodore (1836-1904); French artist famed for his paintings of flowers. In many ways influenced by the Impressionists; also a master of lithography.

Fao, Iraq; oil field, 4-280.

Farad. The practical unit of electrostatic capacitance; defined as that capacitance which, when charged to a potential of one volt, carries a charge of one coulomb. The usual unit of capacity is the microfarad, one-millionth of a farad. The farad was named after Michael Faraday (q.v.), 3-216, 341.

Faraday, Michael (1791-1867). Brit. chemist and physicist, 3-340; electrical theory and experiments, 3-210, 215; experiments in electro-magnetism, 7-307; electrical generation, 3-112; compared with Clerk Maxwell, 5-149.

Far East, term applied to countries of E. Asia—China, Japan, Manchuria, Siam, Siberia, etc.

Far East Air Force (F.E.A.F.). Overseas command of R.A.F., 6 462.

Far Eastern Region. Asiatic territory of U.S.S.R., Siberia; furs, timber, minerals, fisheries; in Kamchatka region, agriculture and cattle breeding; area 900,731 sq. m.; stretches from Vladivostok (Pacific Ocean) to Bering Straits; and N. to the Arctic Ocean. Khabarovsk is the chief city.

Farham. Spt. of Hants, Eng., 8 m. N.W. of Portsmouth; pop. 42,470.

Farol, Guillaume (1180-1565). Fr. reformer and preacher in Switzerland; and Calvin, 2-178.

Farwell, Francis George, Brit. sailor; took possession of "the port or harbour of Natal" in the name of Gt. Brit. in 1824; was murdered in 1829.

Farina. Starchy material used for food and in industrial arts. Prepared from wheat and other grain. Farina used for sizing cotton textiles is usually derived from potatoes.

Farina family, Eau de cologne mfrs.; popularity of their toilet water, 3-156.

Farman, Henri (b. 1874). Fr. pioneer airman; developed biplane known by his name; with his brother Maurice supplied many aircraft to Allies in 1st World War; 1-38.

Farmer's Company. London guild, 4-526.

Farming. See Agriculture.

Farnborough. Tn. in Hants, Eng.; site of govt. aeronautical research station; pop. 26,500; 4-123.

Farne Islands, a group of 17 islets and rocks off the Northumbrian coast, opposite Bamburgh; the isls. have two lighthouses and the remains of a Benedictine priory; it was here that Grace Darling made her famous rescue in 1838; noted sea-bird haunt, 5-461.

Farnese (fah'nē'zā), great It. family, including one Pope, Paul III, a great general, Alessandro Farnese (1517-92), and the dukes and princes of Parma (1515-1731). The Farnese name is connected with several works of anc. art formerly owned by the family.

Faroe Islands ("Sheep Islands"), group of Danish isls. between the Shetland Is. and Iceland; 540 sq. m.; pop. 24,200; fishing, sheep-raising; in 1918 local autonomy granted by Denmark, 3-75.

Farouk (b. 1920). King of Egypt, 1936-52, 3-178; Palestine war, and Neguib's coup, 3-180.

Farquhar (fah'kwār), **George** (1678-1707). Eng. comic dramatist. His most notable play, *The Beaux' Stratagem*, 1701; 3-287.

Farrar, Frederic William (1831-1903), Brit. divine and writer; headmaster of Marlborough (1871-6); Canon of Westminster (1876-95); Dean of Canterbury (1895); (*Life of Christ*, *Life of St. Paul*; *Eric*, or *Little by Little*, and other school stories); 2-366.

FAURE

Farrell, General Edelmiro J. Argentine soldier and politician; pres. of Argentina, 1944-46; 1-226.

Farthing. Brit. coin of least value of a penny. First minted in Edward I's reign and until 1555 it was silver. Minted in copper, 1613 in bronze, 1860. Half farthings were current in Eng. in the early years of Victoria's reign, until 1856; a third farthing is still struck for Malta. Irish coin, 4 285 illus.

Farthingale. Type of crinoline, 2-421.

Faunes. Symbol of Rom. victors and Fuscias, 3-341 illus.

Fascism (fash'izm). Political and social movement in which the state is paramount and militant, 3 341, 4-316; Mussolini and 5 310, 7-484.

Fasho da. Town in the Sudan, on upper Nile; occupation by Fr. in 1898 angered Brit.; adjustment led to mutual support of the two countries in African affairs; re-named Kodok in 1901.

Faustnet. Rock off s.w. coast of co. Cork, Irish Rep. Its lighthouse shows a flashing beam visible for 18 m.

Faustnet Cup. Yacht-racing trophy competed for at end of Cowes Week, 7 511.

Fata Morgana. Form of mirage seen in strait of Messina between Sicily and Calabria. Said to be caused by a fairy (fata) named Morgana.

Fates, in Gk. myth., 3 342.

Father Brown. Character in detective stories by G. K. Chesterton, 2 331.

Father Christmas, and Santa Claus, 2-382.

Father of Algebra. Diophantus.

Father of Angling. Izaak Walton.

Father of Church History. Eusebius of Caesarea.

Father of Comedy. Aristophanes.

Father of English Poetry. Chaucer.

Father of Epic Poetry. Homer.

Father of Geometry. Euclid.

"Father of his Country". Washington.

Father of History. Herodotus.

Father of Italian Prose. Boccaccio.

"Father of Lies". Satan.

Father of Medicine. Hippocrates.

Father of Music. Palestrina.

Father of the English Navy. Alfred the Great.

"Father of the Faithful". Sultan of Turkey.

Father of Tragedy. Aeschylus.

"Father of Waters". The Mississippi.

Fathers of the Church. Early Christian teachers and writers of the 2nd to 5th cents. who are accepted as high authorities on Church dogma.

Fathom. Nautical measure of length and depth, equal to six linear feet. Used to measure cables and ropes and is marked on lead lines, 7 435.

Fathometer. Instrument for measuring depth of sea, 5-191.

Fatima (fa'tima) (c. 606-632). Favourite daughter of Mahomet, wife of Ali, and ancestress of the Fatimid caliphs, 3-175.

Fatimite dynasty. Arabian caliphs who ruled Eg., Syria, and N. Africa 908-1171, 3-175.

Fats. See Oils and Fats.

Fatty acids. Organic acids derived from "open chain" hydrocarbons combined with glycerine in fats and oils.

Fauolt, Helena (1820-98). Brit. actress, the foremost of her time; played with success the parts of Lady Macbeth, Portia, Juliet, and Rosalind.

Faulkner, William (b. 1897). Amer. novelist; *The Sound and the Fury* (1929), *The Unvanquished* (1938), *Go Down, Moses* (1912); 7-365.

Fault, in geology; earthquakes and 3-152.

Fauna. All the animals of a geographical region or of a division of geologic time.

Fauna. In Rom. myth., goat-like creatures, similar to the satyrs of Gk. myth., 6-52.

Faunus (faw'nus). In Rom. myth., rural god identified with Gk. Pan.

Fauré, Gabriel U. (1845-1924). Fr. composer; Requiem, songs, chamber music.

FAUST

Faust [fowst], Ger. magician. 3-343; Goethe's *Faust*. 4-38; opera by Gounod, 3-343, 5-516, 517 illus.

Faustina [faws-ti-na]. Wife of Marcus Aurelius.

Fauvism, in Fr. art. 3-119.

Faversham. Tn. of Kent, Eng., 10 m. S.W. of Canterbury. Industries include brewing, fruit canning, oyster fishing, cement and brick works. Pop. 12,294.

Fawcett, Henry (1833-81). Blind Brit. statesman, reformer, economist, member of parl., and postmaster gen.; inaugurated parcel post and postal savings bank and insurance.

Fawkes, Guy, or Guido (1570-1606). Leader in Gunpowder plot. 3-343; traditional search before opening of Parliament. 6-91.

Fawley, Hants, Eng.: oil refinery. 6-152 illus., 7-101.

Fawn. Name applied to young of deer. 3-59.

Fayal [fi ah'l]. One of the Azores Isls., belonging to Portugal; 69 sq. m.; pop. 19,000; chief tn., Horta, has best anchorage in the Azores; invoking anchor tree with Portugal. (cf. Brit. establish a R.A.F. base near Horta in 1913) 1-330.

Fayolle [fab yoh'l]. **Marie-Emile** (1852-1928). Fr. general, marshal of Fr.; commanded Fr. forces in Somme offensive July-Nov. 1916; commanded central group of armies (1917), northern group (1918).

Fays, faires in Fr. and It. romance. 3-338.

Fayum [fi oom'] or **Fayoum**. Prov. of upper Eg. on W. side of Nile; area 686 sq. m.; pop. 671,885; noted for fertility; cap. Fayum (Medinet el Fayum), pop. 71,311; market for fruits, rice, cotton. 3-173, 196.

Fealty, oath of, in feudal system. 3-318.

Feathering, in rowing. 6-160.

Feathers, 3-344, 7-168; seen as interference colour effect. 2-463; of ostrich. 6-9; feather wear. 1-170.

Featherweight. In horse-racing, the lightest weight that can be carried by a horse in a handicap. In professional and amateur boxing, a featherweight must not exceed 9 st.

February. Second month of the year; origin of name. 5-255.

Fecamp. Spt. of Normandy, Fr.; has fisheries, ship-building yards; Benedictine is distilled here. Pop. 16,876.

Fechner [fek'hner], **Gustav Theodor** (1801-87). Ger. philosopher and physicist, founder of modern psychology and psychophysics.

Federal Bureau of Investigation. Detective service of the U.S. dept. of justice. Estab. 1908 to investigate crimes against federal law, as distinct from offences against laws of individual states. 6-253; 3-353.

Federal government, in Australia. 1-318.

Federated Malay States (F.M.S.). former Brit. protectorate, consisting of native states absorbed in new Federation of Malaya in 1948. 5-97.

Federation of British Industries. Association of U.K. manufacturers founded 1916 to advise on day-to-day problems affecting production and marketing of Brit. manufactured goods.

Feet. See **Foot**.

Feet, in poetry. 6-233.

Fegen, Capt. E. S. Fogarty, V.C. (d. Nov. 5, 1940). Brit. sailor; commanded Brit. armed merchant cruiser *Jervis Bay*; wounded in fight against Ger. pocket battleship, he chose to go down with his ship. See *Jervis Bay*.

Feints, in fencing. 3-316.

Feisal I (II said) (1883-1933). Arab Emir, son of Hussein, Arab king of Hejaz; leader in Arab revolt (1916) and commander of Arab forces in Ist. World War; represented Arabia at Peace Conference; King of Iraq in 1921; 4-462, 4-278, 7-483.

Feisal II (b. 1935). King of Iraq, succeeded his father Ghazi, in 1939; 4-280.

Fel Yen. Beautiful dancer, favourite of an early Chinese emperor; and fashion of footbinding. 2-366.

Feldberg. Highest point of Black Forest, Germany (1,900 ft.). 1-479.

Feldsee. Lake in Black Forest, Germany; area 25 acres; 108 ft. deep; stream draining it flows into L. Titisee. 1-479.

Feldspar. Potassium aluminium silicate. 3-345; in porcelain making. 6-277; and china clay. 2-377; in granite. 4-60.

Felidae. The cat family, including cheetah, lynx, lion, tiger and other members of genus *Felis*.

Felis. The cat genus; includes domestic cats. 2-261; jaguars. 4-336; leopards. 4-481; lions. 4-520; pumas. 6-301; tigers. 7-276.

Felix, Antonius. Rom. procurator of Judea (A.D. 52-60), before whom the apostle Paul, arrested in Jerusalem, was sent to be judged.

Felix the Cat. Film cartoon character who "kept on walking"; introduced by Pat Sullivan in 1921.

Felixstowe. Seaside resort on coast of Suffolk, at mouth of r. Orwell; R.A.F. station and marine testing base; pop. 15,080; 7-182.

Fellaheen, peasant people of Egypt. 1-50.

Felling, in lumbering. 5-50.

Fellowship. Foundation entitling the holder, who is called a fellow, to participate in the revenues of a certain college, and also conferring a right to rooms in the college and certain other privileges as to meals, etc.; its annual pecuniary value varies; formerly a fellowship was tenable for life or until marriage, but nowadays in many cases there is a limit to the period.

Fellow travellers, in Russ. literature. 6-181.

Fells. Name given to mts. in Lake dist., Eng. 4-138.

Felsite. Fine-grained rock, formed from lava which has partly lost its glassy structure, so that small crystals of feldspar and quartz are scattered in a mosaic through it.

Felt. A cloth. 3-345.

Feltham. Urban dist. of Middx., Eng. Aircraft, plastics, sparking plugs and fire extinguishers made. Part of London airport is in the dist. Pop. 43,700.

Felt-hat industry, how hats are made. 4-137, 138.

Felting. In cloth m. manufacture. 2-118.

Felton, John (c. 1595-1628). Eng. assassin; assassination of Villiers (1628). 2-103.

Feluca [feluk'ka]. Sailing boat used on the Nile. 3-179 illus.

Felwort. Species of gentian. 3-513.

Female suffrage. See **Women**.

Feminine ending, in poetry. 6-234.

Femur or thigh bone. Longest bone in human skeleton. 1-114 diag.

Fencing. Art of using the épée, foil and sabre. 3-345.

Fénelon [fān on], **François de Salignac de la Mothe** (1651-1715). Fr. church man and author; Archbishop of Cambrai and tutor to Louis XIV's eldest grandson the Duke of Burgundy; wrote *Télémaque*, famous didactic tale, children's classic; 3-155.

Fenians [fēnlanz]. Irish revolutionary society which flourished about 1861-72; sought to end Eng. rule in Ireland; failure in direct results, but instrumental in convincing Gladstone and others of the need of ending such incitements to disaffection as the Irish Established (Protestant) Church; name derived from the Flannan, legendary band of heroes surrounding Finn MacCool.

Fenn, George Manville (1831-1909). Brit. author of numerous stories of adventure for boys; sometimes wrote in collaboration with G. A. Henty; 2-356.

Fennec. Several species of small, desert-dwelling, fox-like animals of the Old World, characterized by large pointed ears.

Fennel. Herb of parsley family; small yellow flowers; seeds used for seasoning in many countries; leaves

FERMI

are used for flavouring; sweet fennel yields anise-like essential oil.

Fenrir or Fenris the Wolf. In Scandinavian myth., monster, child of the evil god Loki; kept chained by magic till Ragnarök (Judgment Day), when he is destined to break loose, spread his jaws to heaven and earth, and, breathing fire, devour Odin.

Fens, The. Marshy, low-lying districts of E. Eng., in Lincoln, Huntingdon, Cambridge, and Norfolk counties; mostly reclaimed, very fertile; 4-512; 3-252; land drainage. 3-390.

Feodosia (formerly Kaffa, Gk. Theodosia), Rus. Busy port and resort of S.E. Crimea; pop. 41,000; dist. famous for grapes; makes carpets, rugs, soap.

Ferber, Edna (b. 1887). Amer. novelist. *Show Boat* (1926). *Dinner at Eight* (1932); 7-365, 366 portrait.

Ferdalances. South American pit-viper. 7-75.

Ferdinand I (1503-64). Holy Roman emperor; succeeded his brother Charles V (1538); 4-206, 4-129.

Ferdinand II (1578-1637). Holy Roman emperor; succeeded in 1619; and Thirty Years' War. 7-269, 1-501.

Ferdinand III (1608-57). Holy Roman emperor, active in terminating Thirty Years' War; distinguished for intellectual attainments.

Ferdinand I (1793-1875). Emperor of Austria; succeeded 1835; was intermittently insane; informal regency headed by Metternich, and governing in his name, provoked rebellion which led to his abdication (1848); 3-314, 1-326.

Ferdinand I (1861-1918). King of Bulgaria (1887-1918); a Ger. princeling, elected prince of Bulgaria in 1886; assumed title of king or tsar 1908; abdicated in 1918; 2-120.

Ferdinand I (d. 1065). "The Great." King of Castile and Leon, celebrated for victories over Mahomedans.

Ferdinand I (1123-94). King of Naples; able but tyrannical, cruel, and treacherous.

Ferdinand I (1865-1927). King of Rumania; succeeded his uncle Charles (1911). 6-170.

Ferdinand. Kings of Spain. For list see **Spain**.

Ferdinand II (1152-1516) of **Aragon**, "the Catholic" (Ferdinand V of Spain); first ruler of united Spain and patron of Columbus. 2-467, 468; married Isabella of Castile. 4-301; Inquisition under. 4-263.

Ferdinand VII (1781-1833). King of Spain; succeeded on abdication of father, Charles IV, in 1808; deposed by Napoleon same year; restored in 1814; vicious, cruel, incompetent ruler under whom Spain lost colonies on Amer. mainland. 2-28.

Ferdinand I (1751-1825). King of the Two Sicilies; succeeded 1759; stupid, cruel, cowardly; twice de-throned as king of Naples; restored by foreign aid; 2-28.

Ferdinand II (1810-59). King of the Two Sicilies; succeeded in 1830; cruel, treacherous tyrant; earned nickname "King Bomba" by bombarding rebellious cities.

Fergusson, Sir Samuel (1810-86). Irish poet and antiquary; 4-287.

Fergusson, Robert (1750-74). Scots poet. 6-514.

Feria. Spring fair held in Seville, Spain. 7-5.

Fermanagh. Co. of N. Ireland; area 653 sq. m.; pop. 53,040; co. tn. Enniskillen; 3-346.

Fermat, Pierre de (1601-65). Fr. mathematician, and Theory of Probability. 5-117.

Fermentation, 3-346; alcoholic. 1-96; bacteria. 1-344; enzymes. 3-293; yeast. 7-512.

Fermi, Enrico (b. 1901). Ital. physicist who first, in 1934, "split" the uranium atom; Nobel prizewinner in 1938, he settled in U.S.A. and helped produce the atomic bomb.

FERMOY

Fermoy, Irish Repub. Garrison tn. in co. Cork; pop. 4,600; market for agricultural produce and flour.

Fernandes [fernahn'deth]. Juan (c. 1536-1602). Spanish explorer and navigator; Juan Fernandez Islands, which he discovered, were named after him.

Fernando Po. Span. isl. in Bight of Biafra off w. coast of Africa; a., including adjacent isls., 795 sq. m.; pop. 26,400; mountainous; timber, sugar, coffee, tobacco, cacao, cotton, indigo.

Fern-owl. See Nightjar.

Ferns, 3-346, 347 illus.; in plant life, 6-214; spores, 6-530.

Ferozapore [fêrôzpoor'] or **Ferozpoore**. Town and dist. in W. Punjab, Pakistan; pop. town, 73,000; dist., 1,433,000; scene of operations of first Sikh War (1845).

Ferranti, Sebastian Zianide (1864-1930). Brit. scientist; invented an alternator and an elec. meter named after him, and founded the Ferranti elec. co. in 1892; F.R.S., 1927.

Ferrara, Alfonso (Il) d'Este, duke of. See Este, House of.

Ferrara [ferrah'ta]. Commercial city of N. Italy; pop. 134,700; in Po valley 30 m. N.W. of Bologna; medieval seat of famous house of Este; 11th-cent. cathedral and massive campanile; 14th to 16th-cent. school of painting.

Ferraro [ferrah'rô], Gaudenzio (1484-1548). It. painter, one of masters of Milan school; work uneven, but exalts in heads and draperies; colours bright, harmonious; his paintings usually intensely dramatic (Holy Family with Saints; Life of Christ; fresco of The Crucifixion).

Ferret (*Fulvius putorius*). Domesticated breed of polecat, 3-348.

Ferrier, Sir David (1843-1928). Brit. neurologist; contributed much to knowledge of the physiology of the brain, 5 165.

Ferro-concrete. Another name for "reinforced concrete."

Ferrol or **El Ferrol**. Spt. and naval station of N.W. Spain; pop. 30,500; shipping, shipbuilding, fishing.

Ferro-magnetism. Property of certain substances, chiefly iron, nickel, cobalt and their alloys, which become highly magnetised in relatively weak fields; 6-83 with diag.

Ferromanganese. Alloy of manganese and iron, 5-112.

Ferrous sulphate, also known as green vitriol or copperas, 7-187.

Ferrum (Fe). Latin and chemical term for iron. See iron.

Ferry, Jules (1832-93). Fr. statesman, opponent of the empire; premier (1890-91, 1893-95); promoted free, compulsory, non-clerical education.

Fertile Crescent. Semicircle of fertile land stretching from Egypt to Babylonia; map 3-183.

Fertilisation, of flowers, 3-396, 397.

Fertilisers. Substances applied to soil to furnish plant foods; from bracken, 2-37; introduction of chemical fertilisers, 1-78; industrial production, 2-326; from mackerel, 5-64; nitrates, 2-358, 5-444; potassium nitrate, 6-273; saltpetre, 6-492; from seaweed, 1-105 illus. f.

Fescue grass, valuable sweet grass of meadows and pastures of cold and temperate zones; genus *Festuca* of fam. *Gramineae*; includes sheep's meadow, and hard fescues.

Festival of Britain. A cultural exhibition demonstrating Britain's achievements in science, industry, and the arts, held in 1951, with chief centre (area 27 acres) in London, on the S. bank of the Thames, 3-328; architecture, 1-219.

Fetish, in magic, 5-79.

Fetlar, Scot. One of the Shetland Isls.

Fetlock. Of horse, 4-196 diag.

Fettes [fê'tes] College. Scot. public school in Edinburgh, opened in 1870.

Feuchtwanger [foikht'vahnger], Lion (b. 1884). German-Jewish writer; wrote novels of great dramatic force

and rich historic background (*The Ugly Duchess*; *Power*; *Jew Sâse*), 4-14.

Feudal System, 3-348, 5-200; William I and, 2-276; knighthood, 4-417; in France, 2-449; serfdom, 7-66.

Feuillants. Party of constitutional royalists, who supported Louis XVI in Fr. Revolution, 2-468.

Feverfew. Perennial plant, family *Compositae*, native to Europe. Height up to 9 in. Small, clustered, daisy-like, yellow-centred white flowers. Has strong aromatic odour. Used as herbal remedy for fevers; as wild chrysanthemum, 2-385.

Fez. City and northern cap. of Morocco, 125 m. S. of Strait of Gibraltar; pop. 200,900; caravan trade centre and distributing city for N. Africa; independent from 15th to 16th cent.; gave name to cap.; bazaar, 5-265 illus.

Fez. Brimless red cap formerly worn by Turks and still worn in Egypt and other countries of N. Africa and the Near East.

Fezzan. A division of the kingdom of Libya, N. Africa; cap. Murzuk; dates, camels, and horses; oases, 4-489.

Fian'na Fâil (foil) (Soldiers of Destiny). Irish political party of Famon de Valera, formed in 1926; held power 1932-Feb. 1948; abolished oath of loyalty to Brit. crown and post of gov.-gen.; introduced 1937 constitution and name of Eire; 3-81.

Fibre glass, 4-32; wool and cotton, 7-475 with illus.

Fibrin. Thread-like substance produced by the reaction of prothrombin and fibrinogen; in clotting of blood, 1-490.

Fibrinogen, in clotting of blood, 1-490.

Fibroin. Substance produced by silk moth caterpillar, 7-54.

"Fibrolane". A casein fibre, 6-369.

Fibula. Outer of the two bones forming the skeleton of the lower leg, 1-141 diag.

Fichte [fikht'e], Johann Gottlieb (1762-1814). Ger. idealistic philosopher who built on the foundation of Kant's teaching; *Addresses to the German Nation* stimulated patriotic resistance to Napoleon; 6-160.

Ficus [fik'us]. A genus of trees including figs and the India-rubber tree.

Fiddle. See Nautical Terms (table).

"Fido" (Fog Investigation Dispersal Operation). Method of clearing aircraft runways of fog; first used operationally on Nov. 19, 1943; use limited by enormous oil consumption, 3-105.

Fidra. Isl. off coast of E. Lothian, Scot., 5-40.

Fief. In feudal system, lands received by vassal from a lord; conditions of tenure, 3-348.

Field, Cyrus West (1819-92). Amer. financier; projector and promoter of the first submarine transatlantic cable, 2-153.

Field. In electricity, that space in the neighbourhood of a charged body, as of a varying magnetic field, throughout which an electric charge would experience a mechanical force.

Field. In heraldry, the surface of an armorial shield on which charges are placed. The same term is used for the body of a flag, e.g. the flag of Eng. is a red cross on a white field.

Fieldfare. Largest Brit. bird of the thrush tribe; a winter visitor, breeding in Scandinavia; grey-blue on back, blackish tail; birds form noisy flocks in winter, feeding on berries and leaving in April, 7-271; migration, 5-204 illus. f.

Field glass, 7-250.

Fielding, Henry (1707-54). Eng. novelist, 3-849, 5-471, 8-288; and Bow Street Runners, 6-247.

Field madder. Annual plant, family *Rubiaceae*, native to Asia and Europe. Height 6 in., trailing stems. Small blue, pink or lilac flowers in terminal heads.

FILIGREE

Field-Marshal. Highest rank in Brit. army. Equivalent to admiral of the fleet in R.N., and to marshal of the R.A.F. A field-marshal holds rank for life and cannot retire. Rank indicated by crossed batons surrounded by wreath and surmounted by a crown.

Field mouse, 5-288, 289 illus. f.

Field Museum of National History, Chicago, U.S.A., 5-301.

Field of the Cloth of Gold, plain in N. Fr., near Calais, so called from display on occasion of meeting of Henry VIII and Francis I, 1620; 4-163.

Field pea. Variety of pea; split peas from, 6-89.

Fields, Grace (b. 1898). Brit. entertainer; a native of Lancashire, famous on stage, screen and radio as comedienne and singer; created C.B.E. in 1938.

Field Woodrush, grass, 4-frontis.

Fiescher glacier, on the Finsteraarhorn Switz., 1-121 illus.

Fiesole [fê'sôlê]. City of It. in prov. of Florence; pop. 10,400; home of Fra Angelico; anc. *Faetulae*, important Etruscan city; 3-392.

File Ness, Scot. A low headland, at the easternmost point of Eire; there is a lighthouse at Carr Reef, 1 m. out to sea.

Fife. Co. of Scotland; a. 500 sq. m.; pop. 300,855; co. in Cupar, 3-360.

Fifth Avenue, New York City; a fashionable shopping centre, 5-41;.

Fifth Coalition, in Napoleonic Wars, 5-322.

Fifth Column. Phrase first used in the siege of Madrid, in the Sp. civil war, 1936-39, when Franco's four besieging columns outside the city were helped by sympathisers, i.e. "fifth column," inside the city, since used of those inside a country who work in collusion with enemies outside.

Figaro [fê'gahrô]. The daring, witty roguish barber in Beaumarchais' *Barber of Seville* and *The Marriage of Figaro*; a brilliant Parisian periodical is named after him.

Figg, James (d. 1734). Eng. fencing master and populariser of boxing, 2-29.

Fighting Téméraire. The. Painting by J. M. Turner, 3 264, 269 illus.

Figs. Edible fruit of a deciduous tree, *Ficus caria*, 3-350; packing, 7-344 illus.

Figure-eight tie. Kind of knot, 4-422 illus.

Figure of Speech, 3-351.

Figwort. Plant of order *Scrophulariaceae*; several species common in Britain; 4-sided stems, opposite leaves, brownish, lipped flowers; pollination by wasps, 3-440.

Fiji. Group of Brit. isls. in Pacific, pop. 293,764; cap. Suva; 3 351, 6-26 stamp, 6-30 illus.

Fil. See Money (table).

Filament. In botany the stalk of a stamen, 3-397.

Filament, in electric lamps, 3-220.

Filbert. A type of hazel-nut grown commercially, 4-143.

Filchner Shelf ice, ice-sheet in Ant. arctica, 1-164.

Filey, Eng. Seaside resort in east riding of Yorkshire, on E. coast, 9 m. S.E. of Scarborough, overlooking Filey Bay; Filey Brig., rocky promontory; pop. 4,764.

Filibuster. Originally, a freebooter now, one who takes part in a military expedition to a foreign country in time of peace for personal aggrandisement or political annexation. Walker expedition to Nicaragua (1855-60) and Dr. Jameson's raid in South Africa (1895-6) are famous filibustering expeditions; in legislation one who by dilatory tactics delays or prevents passage of bills; 3-121.

Filigrane. The form class of plants.

Filigree. Decorative work in fine wire of gold, silver, or copper. Detachable lacework in Gothic architecture called filigree.

FILIPINOS

Filipinos. People of Philippine Is.: characteristics, 6-157.
Filian, St. Scot. 8th cent. saint. Lived in a cell nr. St. Andrews and founded a church at Glendochart, Perthshire. Festival, Jan. 9.
Fillet. See **Meat** (table).
Fillet, in architecture, a raised rim, narrow ornament, or moulding; a plain line or band.
Film, photographic, 6-181, 6-171 illus.; sound track, 6-169; film strip, 2-393 illus.
Film cartoons, Walt Disney and, 3-92.
Films. See **Cinema**.
Filter, in air conditioning, 1-82.
Filter, in photography, 4-501.
Filter press. Filter through which liquid is forced under pressure.
Filtration. Process of straining or purification by passage through a filter; used in chemistry, 7-426 with illus.
Fin, in aeroplane, 1-39 diag.
Finale. See **Musical Terms** (table).
Finance. The work of obtaining and using money and credit for the support of private and public enterprise; banks and banking, 1-363; economics, 3-159; gold standard, 4-13; taxation, 7-230.
"Financial Times." Founded in London in 1888 as a daily newspaper devoted to financial interests; has a high reputation for its news and honest criticism; in 1924 it incorporated the *Financial*, and in 1948 the *Financial News*.
Finback Whale, 7-445-446 with illus.
Finch. Bird family, *Fringillidae*, distributed over most of the temperate zone, except Antarctica, 3-352.
Findhorn, r. of Scot., 62 m. long, flowing into Moray Firth; salmon fishing, 5-261.
Fine Arts; Aegean and Cretan, 1-23; architecture, 1-209; art collections, 2-451; Byzantine art, 2-149, 150; drawing, 3-123; embroidery, 3-237; English art, 3-258; etching, 3-299; Fr. painting, 3-439; Gk. art, 4-89, 6-33, 5-531, 532, 3-228; Italian art, 4-317; Muslim, 5-302; Netherlands art, 5-381; painting, 6-33; poetry, 6-233; pottery, 6-274; Roman art, 6-440; sculpture, 6-519; Span. art, 7-112.
Fingal. A name by which the legendary Celtic hero Finn MacCool was sometimes known in Scots legend; popularised by Macpherson's epic *Fingal*.
Fingal's Cave. Cave of basalt columns on Isl. of Staffa, Inner Hebrides, 7-140 with illus., 2-281; Mendelssohn's overture, 4-152.
Fingerprints, 3-353; skin patterns, 7-65; fingerprint dept. at Scotland Yard, 6-251.
Finial. See **Architectural Terms**.
Finistère. Dept. of Brittany, France, 2-91.
Finistère [finist'ar], Cape ("land's end"). High promontory on n.w. coast of Spain; naval victories of Brit. over Fr. in 1747.
Finland. Republic of N. Europe; 117,914 sq. m.; pop. 4,032,538; cap. Helsinki, 3-353; flag, 2-384 illus. f.; stamp, 7-143 illus.; bathing, 1-385; in 2nd World War, 7-486, 490, 496.
Finland, Gulf of. Arm of Baltic Sea between Finland on N. and Russia with Estonia on S.; length 260 m.; width 25 to 80 m.
Finlay, Donald (b. 1909). Brit. athlete, represented Gt. Brit. at Olympic Games in 1932, 1936, 1948; A.A.A. champion for 120 yds. hurdles for 7 consecutive years, 1932-36, and for the eighth time in 1948.
Finn MacCool or Fionn MacCumhail. Celtic (Irish) legendary hero, leader of the Fianna; lover and husband of Grania; and father of the bard Ossian (Oisín); and legend of Giant's Causeway, 4-18.
Finn-Karelia. See **Karelo-Finnish S.S.R.**
Finnish haddock, 4-115.
Finnish-Tatars. The great division of the human family which includes the Finnish or Finno-Ugric peoples of

Europe and the Mongolo-Tatars of Asia.
Finno-Ugric. Name of a division of Ural-Altaic family of languages and their speakers; Finns include not only inhabitants of Finland, but similar tribes in Russia, etc.; Ostaks, Voguls, and Magyars, allied tribes, are called Ugric, from Yura or Ugra, country on either side of Ural Mts.
Finsbury. Met. bor. of London; pop. 35,347; 5-27.
Finssen, Niels (1860-1901). Danish scientist; first to use ultra-violet rays for skin diseases; inventor of light treatment for lupus.
Finsteraarhorn [finst'era'horn]. The highest summit of Bernese Alps; 40 m. n.w. of Bern, Switzerland (14,025 ft.); 1-124 illus.
Fionn Loch, Ross and Cromarty, Scot., 6-455.
Fiord. See **Fiord**.
Fir. Cone-bearing tree, 3-355, 2-484; cone of Douglas fir, 2-483 illus.
Firdausi [firdow'si]. Firdousi, or Firdusi (c. 940-1020). Persia's greatest poet; real name Abul Kasim Mansur; author of *Shah Namah*, or Book of Kings, an epic history of Persia from the legendary kings to the Mahomedan conquest, A.D. 641.
Fire, 3-356; primitive Man and, 5-107; asbestos in fire protection, 1-262; gas fire, 4-149; as a cause of rapid oxidation, 6-23; fire protection in sales, 6-183; heating, 4-149; by friction, 3-356.
Firearms, 3-357; artillery, 1-258; anti-aircraft artillery, 1-171; naval guns, 5-353, 354, 355 illus.; influence on army organization, 1-247; machine-gun, 5-63; rocket compared with gun, 6-421; shooting, 7-12.
Fire box, of locomotive, 5-2.
Fireclay. Form of clay so called because articles made from it have great resistance to heat, and do not split when exposed to rapid change of temperature, 2-406, 2-57.
Firedamp. Name given by miners to marsh gas or methane which issues from porous coal seams. Diluted with air it becomes highly inflammable; and safety lamps, 2-432.
Fire-engine, 3-361.
Fire-fighting, 3-361; and forest fires, 3-422 with illus.
Fire-boat, 3-363 illus.
Firefly. Nocturnal beetle, mostly native to the tropics. Emits after dark, reddish-yellow or green-blue light, according to species, 3-364, 1-416.
Fire insurance. development after Great Fire, 4-271.
Fire Services, careers in, 2-236.
Firships, Drake and Span. Armada, 5-354.
Firestick. Early type of match, 5-146.
Fire-tube boiler, 1-504.
"Fire-wood." A species of willow-herb, 7-455 with illus.
Fireworks, 3-364; gunpowder rocket, 6-421; magnesium in, 6-81.
Firkin. Eng. ale measure, equivalent to 91 imperial gallons. Also a small wooden butter cask holding 56 lb.
Firm. See **Stock Exchange Terms**.
Firozapore. See **Ferozapore**.
Firring. See **Architectural Terms**.
First Aid, 3-365, for poisoning, 6-238; Red Cross, 3-370.
First Folio edition of Shakespeare's plays, pub. 1623, 7-15; portrait of Shakespeare by Martin Droeshout, 7-13.
First Lord of the Admiralty. In Brit. govt., 1-20.
Fischer von Erlach, Johann Bernard (1656-1723). Austrian architect, specialised in baroque style; work in Vienna, 1-325.
Fish and Fisheries, 3-377, 5-127, 3-369-376 illus.; aquariums and aquarium fish, 1-187, 188, 189 illus.; deep sea, 5-496, 497, 1-450; field of vision, 3-334 diag.; fish parasites, 6-78; fossil fish, 3-425 illus.; luminous, 1-450 illus.; protective coloration, 6-297; respiration, 6-389; skeleton, 7-60; tropical fish, 3-frontis; herring fisheries,

FJORD

4-171; mackerel fisheries, 5-64; Newfoundland Banks, 5-395; Norwegian fisheries, 5-404. See also articles on individual fishes, and **Food Fishes** (table).
Fisher, Geoffrey Francis (b. 1887). Bishop of London, 1939-45; Archbishop of Canterbury, 1945.
Fisher, Herbert Albert Laurens (1863-1940). Brit. historian and politician. Pres. Board of Education, 1916-22 (*A History of Europe*, etc.).
Fisher, John (c. 1150-1535). Eng. bishop, chancellor of Cambridge; friend of Erasmus and leader in New Learning; opposition to Henry VIII's divorce and refusal to recognize him as head of English Church led to execution for treason.
Fisher of Kilverstone, John, 1st Baron (1841-1920). First Sea Lord of Brit. Admiralty (1901-10 and 1911-15); introduced Dreadnoughts and big-gun battleships.
Fisher marten. See **Black marten**.
Fishes [fishes]. One of the 12 signs of the Zodiac, 7-524 illus.
Fishguard, Wales. Spt. of Pembrokeshire in N. on Fishguard Bay; rly. terminus on route to Tre.; pop. 4,840; excellent harbour; fisheries; 6-111.
Fish-hook money, 5-234 illus.
Fishing, 3-382; boats, 1-497; with cormorants, 2-507, 2-367 illus., in New Guinea, 5-396 illus.; nylon lines, 5-488; coarse fish, 6-403; European industry, 3-309.
Fishing rod, for coarse fishing, 3-383; fly-fishing and sea angling, 3-384.
Fishmongers' Company, a London livery company, 4-326.
Fission, in atomic physics, 1-300.
Fissure of Rolando, in brain, 2-10 diag.
Fitton, Mary. Maid of honour to Queen Elizabeth I; supposed by some to be the "dark lady" of Shakespeare's Sonnets.
FitzGerald, Edward (1809-83). Brit. poet, whose famous translation of the "Rubáiyát" of Omar Khayyám is an almost unique instance of successful "translation" of a foreign poem; 5-511.
FitzGerald contraction, in physics, 6-380.
Fitzherbert, Maria Anne (1756-1837), known as Mrs. Fitzherbert. Wife of George IV of Gt. Brit., who married her privately in 1785, ten yrs. before his official marriage to Caroline of Brunswick.
Fitzroy, r. of Queensland, Australia, 100 m. long, flows to Keppel Bay on the Pacific coast, 6-322.
Fitzroy. One of the chief rivers of Western Australia, 300 m. long; flows into Indian Ocean.
Fitzsimmons, Robert (1862-1917). Brit. boxer; world's middle-weight championship (1890); heavy-weight champion (1897).
Fitzwilliam Museum, Cambridge, 2-182.
Fiume [fjoo'má]. Yugoslavia. Spt., formerly It., on Adriatic sea; ind. city state 1920-24; 8 sq. m.; pop. (1939) 53,900; seized by D'Annunzio, 1-159.
Five Members. The. John Hampden, John Pym, Denzil Holles, Sir Arthur Hazelrigg, and William Strode, members of parliament whom Charles I tried to arrest, Jan. 4, 1642; 3-278.
Five Nations. See **Iroquois Indians**.
Fives. A game, 3-385; Eton fives, 3-305.
Five Towns. The. Name given to the five pottery towns now forming Stoke-on-Trent; and Bennett, 1-430.
Five-Unit code, replacing the Morse code in telegraphy, 7-237 illus.
Five Year Plan. Scheme introduced by Stalin in 1929 for the complete reorganization of the economic system of U.S.S.R.; was followed by second and third Plans, and by post-war Plan.
Fixatives, in perfumes, 6-124.
Fizeau [fize], Armand H. L. (1819-96). Fr. physicist; measures speed of light, 4-498, 3-301.
Fiord. Scandinavian name for a long,

IMPORTANT FOOD FISHES OF THE BRITISH SEAS

Name	Description	Habits	Remarks
Cod	Sea fish with long barbel under chin. Back and sides greenish with brown spots. May weigh as much as 100 lb.	Will apparently eat anything, but largely predaceous. Abounds in British seas during the spawning season in spring.	Apart from herring, the world's most valuable food fish. Cod fisheries are an important industry in many countries.
Haddock	Resembles cod, with smaller mouth, dark spot behind head. Black lateral line. Average size, 3 to 4 lb.; largest, 20 lb.	Found on cod fishing-grounds in large schools; feeds on bottom of the sea, and unlike cod, chiefly eats molluscs and crustaceans.	A valuable food fish; will keep on ice longer than most varieties. "Finnon haddie" (Fin-don haddock) is smoked haddock.
Hake	Member of the cod family, dark grey on back, lighter below, no barbels. Rarely more than 3 ft. long.	Fairly common in British waters, especially off the Cornish coast; feeds chiefly on pilchards.	Flesh is white and of good flavour.
Halibut	Member of the flat-fish family, with both eyes on right side. Dark above and whitish below. Average weight, 50 to 75 lb., but grows to an enormous size.	Has about same geographical range as cod, showing a preference for cold water. Feeds on crabs, molluscs, and on other fish.	Important as a food supply; halibut liver oil has recently largely replaced cod-liver oil in medicine. Food value greater than cod but less than mackerel.
Herring	Well-formed sea-fish, thin scales, blue-green above, silvery-white below. Average length 12 in.	Great schools come into shallow water to spawn. Principal food, plankton.	Most important food fish in world; not used as extensively in America as in Europe.
Mackerel	A perfectly proportioned sea-fish, varying in length from 10 to 20 in., in weight from $\frac{1}{2}$ to 3 lb. Bluish or green with wavy black stripes on top, silvery beneath.	Travel near the surface of the sea in huge schools, sometimes so large as to cover 10 square miles. Feed on small ocean fish.	Caught in nets and on line. Highly prized for food, especially fresh. Spanish mackerel (found in both North and South Atlantic) are not so abundant.
Plaice	Flat-fish, darkish-brown with red spots on upper surface, eyes on right side; never a large fish, usually 10 to 13 in. in length.	Like other flat-fish, feeds on bottom, when adult eats shell-fish; in summer lives offshore, in winter inshore and in estuaries.	Most important flat-fish of British seas, though many small plaice are destroyed as unmarketable.
Salmon	Large fish living in salt and fresh water; nearly 100 species. Brownish above with silvery sides, black dotted; flesh reddish-orange.	Ranges northward of Spain in Europe, and of New York in N. America. Spends much of life in salt water, enters fresh-water streams to spawn.	Salmon are caught in nets as well as on rod and line in Britain; season strictly limited by law. Among the most esteemed food fishes.
Smelt	Small fish related to the salmon, and silvery in colour.	Found in some English rivers, including the Medway and on the east and west coasts of Great Britain.	Prized as food because of delicate flavour. When fresh they have a smell resembling cucumbers.
Sole	Small flat-fish of oblong form, brown, blotched above, whitish below; eyes on right side. Several closely related species. Lemon sole belongs to plaice genus, as also does the dab.	In common with plaice and other flat-fish, likes a clean, sandy bottom, and is chiefly caught in inshore waters.	The true sole is often considered finest-flavoured of all sea-fish and is correspondingly valuable as a fishery. Lemon soles and other similar fish are often substituted for it.
Turbot	Large sea-fish of the flat-fish family; brown above whitish below, sometimes attaining weight of 70 lb.	Ranges from the Mediterranean to the coast of Scandinavia. Feeds on crabs, sea-urchins, and fish eggs.	Highly esteemed as food; one of the best of flat-fishes.
Whiting	Small member of cod and haddock family distinguished by lighter colour and black spot at base of pectoral fin.	Common in shallow and medium waters from North Sea to Mediterranean.	Popular food fish, and one of the cheapest.

FLABELLUM

narrow sea-coast inlet, usually steep sided and very deep, 6-187 illus.; in Norway, 5-462, 464 illus.

Flabellum. Medieval fan used in church ceremonies, 3-340.

Flag, type of iris, 4-281.

Flag. Piece of fabric flown from staff or halyard as national or local emblem, or naval or military sign, 3-385, 3-384, 385 illus. 1.; admiral's flag, 1-20 illus.; cable ships, 2-153 illus.; Nelson's signal, 5-363 illus.; of St. George, 3-520; signalling by, 7-52 illus. f.; Union Flag (Jack), 7-346.

Flag Day. Day on which flags and other emblems are sold for charitable purposes; Alexandra Day, 1-101.

Flagella, "feelers" of algae, 1-104.

Flageolet. Woodwind instrument of flute tone, played vertically through a mouth-tube. Four keys operated by fingers. Has compass of two octaves. Tone sweet, though weak.

Flag officers. In Royal Navy, 1-20.

Flag tank, 5-219 with illus.

Flak. Ger. name for anti-aircraft gunfire, from initials of *Flugabwehrkanone*.

Flam borough Head. A cape on coast of Yorkshire, 18 m. S.E. of Scarborough.

Flamingo. Large wading bird, 3-385; foot, 3-113 illus.

Flaminian Way (*Via Flaminia*). Road from anc. Rome to Ariminum (modern Rimini) constructed by censor Flaminius (220 B.C.).

Flamininus (*Flamininus*), Titus Quinctius (c. 230-c. 176 B.C.). Roman general, victor of Cynoscephalae (197 B.C.) and "liberator of the Greeks."

Flamsteed, John (1646-1719). Eng. astronomer; began first catalogue of fixed stars.

Flanders. Dist. of N.W. Europe, 3-387.

Flannan Isles. Cluster of seven small isls. in Outer Hebrides, Ross and Cromarty, Scot. There is a lighthouse, otherwise isls. are uninhabited.

Flaps, in aeroplane, 1-39, 10 diag.

Flashing lights, of lighthouse, 4-502.

Flashpoint. The lowest temperature at which a volatile liquid gives off sufficient inflammable vapour to provide a momentary flash when a small flame is applied. See Abel Test.

Flat-fish, 3-377 with illus.

Flat foot, 3-114.

Flatford Mill. Subject of a famous painting by Constable, 7-182 illus.

Flatworm, 1-151, 157 illus.

Flaubert (Robert), Gustave (1821-80). Fr. novelist and literary artist (*Madame Bovary*, *Salammbô*); 5-172, 3-456.

Flavine. Antiseptic derived from acridine, a constituent of coal-tar.

Flax. Annual plant, family *Linaceae*, 3-387; leaves, 4-171 illus.; linen from, 4-511.

Flaxman, John (1755-1826). British sculptor and designer; monumental

works in Westminster Abbey and St. Paul's cath., London; designed Wedgwood pottery; 6-524.

Flea. Small parasite, 3-388, 6-78.

Flecker, James Elroy (1881-1915). Brit. poet (*The Golden Journey to Samarkand* and an Oriental drama *Hassan*).

Fleet. Former r. in London flowing into Thames, now large covered sewer, gave name to Fleet Street and Fleet Prison, 7-421 illus.

Fleet Air Arm, formation 6-462.

Fleet Prison. Former London prison on bank of r. Fleet. Destroyed in 1666 and 1780, rebuilt each time. Used for bankrupts and debtors. Demolished 1864, 6-291.

Fleet Street, London. Temple Bar to Ludgate Circus, famous for newspaper offices, 5-21, 5-32 illus.

Fleetwood. Port in Lancs., Eng.; pop 27,525; fisheries; 4-444.

Fleming, Sir Alexander (1881-1956). Brit. medical scientist, discovered properties of penicillin, 3-388, 1-171, 175, 5-165; portrait, 5-163.

Fleming, Sir John Ambrose (1819-1915). Brit. physicist; inventor of thermionic valve, 6-341, 346.

Flemings. Flemish-speaking people of N. Belgium, 1-419, 420.

Flemish language, 1-419, 420.

Flemish school of painting, 5-381, 6-34.

Fleur-de-lis (Fr. lily-flower). A symbol in heraldry. Found among Egyptian hieroglyphics. Used by Anglo-Saxon and Carolingian kings and in the arms of France.

Flight, theory of, 1-31; early experiments in, 1-27-30; altitude and air pressure, 1-80; heights judged by barometer, 1-371; of birds, 1-453; of eagle, 3-145; feathers and, 3-344; of insects, 4-264; of raven, 6-367. See also *Aeroplane*; *Glider*.

Flight-lieutenant, in R.A.F., 6-463.

Flight-sergeant, in R.A.F., insignia, 6-462 illus.

Flinders, Matthew (1771-1814). Brit. sailor; explored coasts of N.S.W. and Tasmania (1793-99) and N. Australia (1801-03), 7-102.

Flinders, r. in Queensland, Australia, 6-322.

Fletcher, John (1579-1625). Eng. dramatist, collaborator with Francis Beaumont. Massinger, Middleton, Rowley and Field, 3-119.

Flint, Michigan, U.S.A. (City on r. Flint; pop. 163,313), 5-192.

Flint. A mineral, 3-388.

Flint glass, 4-30.

Flint implements of prehistoric Man. 3-388, 389 illus., 5-106 illus.

Flint-lock gun, 3-359, 358 illus., 3-389.

Flintshire, Co. of Wales; 256 sq. m.; pop. 115,108; co. tn. Mold; 3-389.

Floating-dock, 3-98 with illus.

Floating mines, in naval warfare, 5-220.

Flooden, Battle of (1513), 3-389, 5-161.

Floods, 3-390; in Brit. and Netherlands, 5-499; Mississippi, 5-226; Netherlands, 5-377, 379 illus.; of Nile, 5-439, 3-178 illus.

Floor brad. Type of nail, 5-313.

Flora. All the plants of a region or of a division of geological time.

Florence. City of cent. It. pop. 394,000, 3-392; Laurentian library, 4-458 illus.; Renaissance cultural centre, 4-313, 317. Palazzo Vecchio, 4-318 illus.; Savonarola and, 6-500.

Flores. Westernmost isl. of the Azores, in Atlantic Ocean. Area 57 sq. m.; pop. 7,500; cap. Santa Cruz.

Flores. Isl. of Indonesia, c. of Java, 8,870 sq. m.; pop. 130,000, mostly Papuan savages, 2-286.

Flor'ey, Sir Howard W. (b. 1898). Australian pathologist; with E. B. Chain purified penicillin extract; Nobel prizewinner 1945; 1-174.

Florida. State, U.S.A.; 54,560 sq. m.; pop. 2,771,305; cap. Tallahassee; 3-393; discovery, 1-133.

Florin (from Latin *flor*, "flower"). Florentine gold coin, first used in 13th cent.; so named because of lily on the obverse; also modern Dutch coin; Eng. 2-shilling piece also called florin; 3-392, 5-233 illus. f.; Irish coin, 4-285 illus.

Florio, John (c. 1553-1625). Brit. author; translator of Montaigne, 5-249.

Flotsam, jetsam, and lagan. Eng. legal terms; flotsam means shipwrecked goods which float; jetsam, goods thrown overboard and lost; lagan, goods fastened to a buoy.

Flounder. A flat-fish similar to the plaice but smaller.

Flour and Flour milling, 3-393; and bread, 2-30, 52, and wheat, 7-448.

Flowers, 3-395; anatomy of, 2-25 illus. f.; Australian, 1-312; botany, 2-24; Brit. wild flowers, 2-21 illus. f.; colours and fertilisation, 6-216; 2-21 diag., market gardening, 5-130; seeds, 6-528.

Flowers of sulphur, 7-187.

Flue-boiler, 1-501.

Fluid, defined, 6-185.

Fluke-worm, parasite in animals, 7-5(0).

Fluorescence, 6-161.

Fluorescent ink, 4-451 illus.

Fluorescent lamp, 3-220, 4-501.

Fluorescent lighting, 6-162.

Fluorescent screen. That part of a cathode ray tube on which the luminous spot appears. It consists of a surface layer of fluorescent material on which the electron beam is focused.

Fluorine (F.). Non-metallic element of the halogen group; 4-120, 3-221.

Fluorspar or fluorite. A calcium fluoride; crystals, 5-213 illus.; fluorescence, 6-161.

Flushing (Dutch *Vlissingen*). Fortified port in S.W. Netherlands on isl. of Walcheren; pop. 22,500.

Flute. Wind instrument, 5-307, 7-473. Apollo and, 1-183.

Flux. Material used in soldering, welding and brazing of metals. It protects surfaces from effects of atmosphere which otherwise would combine with the metals and prevent their being joined. Fluxes for solder-

FLORAL EMBLEMS OF THE NATIONS

Abyssinia—arum lily
Argentina—kapok-tree flower
Australia—minosa (wattle)
Austria—edelweiss
Belgium—azalea
Bolivia—Bolivian magic-tree flower
Brazil—*Tecoma araliacea*
British Commonwealth—daisy
Bulgaria—rose
Canada—maple leaf
Chile—Chilean bellflower
China—plum blossom
Colombia— triana cattleya (orchid)
Cuba—fragrant garland flower
Czechoslovakia—linden tree
Denmark—red clover
Dominican Republic—mahogany flower
Ecuador—red cinchona flower
Egypt—lotus
England—red rose and white rose

Finland—lily of the v. v
France—marguerite, poppy and cornflower (since Republic)
 —flour-de-lis (iris) (Royalist France)
Germany—cornflower
Greece—laurel leaf
Guatemala—white orchid
Hungary—tulp
India—lotus
Iran or Persia—red rose of Shiraz
Ireland—shamrock
Italy—marguerite
Japan—chrysanthemum
Lithuania—common rue
Mexico—dahlia
Netherlands—marigold
New Zealand—fern leaf
Nicaragua—fragrant garland flower
Norway—heather

Panama—Holy Ghost or dove flower
Paraguay—jasmine of Paraguay
Peru—Peruvian magic-tree flower
Poland—daisy, poppy, pansy, mallow
Portugal—lavender
Rumania—white rose
Russia—sunflower
Salvador—coffee flower
Scotland—thistle
South Africa—protea
Spain—carnation
Sweden—lily of the valley and the twin-flower
Switzerland—rose of the alps (rhododendron)
Turkey—tulp
Uruguay—kapok-tree flower
U.S.A.—wild rose
Wales—leek
Yugoslavia—linden tree

FLY

ing incl. resin, zinc chloride, hydrochloric acid and borax.

Fly. Two-winged insect, order *Diptera*. 3-401; eye, 3-333 illus.; eggs, 3-171 illus.; and spider, 1-152.

Fly, c. of New Guinea, 800 m. long, 5-396.

Fly agaric. Poisonous fungus (*Amanita muscaria*) native to N. temperate regions. Height 3-5 in., creamy-white stem and gills. Upper side of cap orange-scarlet, flecked with white. In N. Asia juice is used in distilling vodka.

Fly-catcher. Insectivorous birds of the family, in Britain, *Muscicapidae*. British species are the pied and spotted fly-catchers. American "fly-catchers" belong to the family *Tyrannidae*; 3-402; and cat, 5-332 illus.

Fly-fishing; flies used, 3-384; casting for salmon, 3-382 illus.

Flying boats, in early Atlantic services, 1-85; compared with aeroplanes, 1-86.

Flying Bombs, 3-403, 7-495, 496 illus.; London raids, 5-28.

Flying-dragons. Kind of lizard; habits, 4-528.

Flying Dutchman. A legendary Dutch sea-captain, doomed for a rash oath or as punishment for crime to sail about the Cape of Good Hope till Judgment Day; subject of opera by Wagner, 5-517, 7-408.

Flying Fish, 3-404, 3-377.

Flying-fox. Malayan fruit bat, 1-382.

"Flying Hamburger." Ger. diesel train, 5-8 illus.

Flying machines. See *Aeroplane*; *Airship*; *Balloon*; *Flight*, etc.

Flying officer, in R.A.F., 6-463.

Flying Records. See *Air Records*.

Flying Squad. Mobile detachment of a police force equipped with fast cars for dealing with sudden outbreaks of crime. First estab. by London Metropolitan Police, 1919. Cars, which bear no police insignia, are in radio touch with h.q.

Flying squirrels, 7-140.

Flying Tippers. Racing pigeons, 6-198.

Flying toad. See *Nightjar*.

Flying Wing, 1 44, 12 illus.

Fly Mushroom. See *Red-cap Amanita*.

Fly-shuttle, in weaving, 7-434.

Flywheel. A heavy wheel mounted on a shaft that receives its turning impulses intermittently; by virtue of its weight it resists sudden changes of velocity and stores up energy, thus ensuring uniform motion; effects of centrifugal force, 2-293.

Foam, formation of, 2-455; in fire-fighting, 3-362.

Focal length, in optics, 4-481, 5-523.

Foeh, Marshal Ferdinand (1851-1929). Fr. general and marshal of Fr., c-in-c. of Allied armies in 1st World War, 3-401, 7-482.

Foehabers. In Morayshire, Scot. 5-261.

Foehs, of camera, 3-331; of eye, 3-331, 332 illus.; lens, 4-481; in optics, 5-523.

Fodder. Coarse feeding stuffs for cattle; beet, 1-411; clover, 2-423; lucerne, 5-48; feeding for horses 4-196.

Fog, 3-405; caused by warm ocean currents, 5-498; navigation by radar, 5-341; fly. signals, 7-52.

Fogazzaro [fogatzsahr'], Antonio (1842-1911). It. novelist and poet; his prose works depicted the life and thoughts of the It. people.

Fogg Art Museum, Harvard, U.S.A. 5-301.

Foggia [foj'ah]. City in s. It.; pop. 62,300; market for agric. produce of great Apulian plain.

Föhn. Warm, dry southerly wind which blows down the leeward slopes of the N. Alps, 7-459. See also *Chinook*.

Foil. A light fencing weapon, 3-345, 346 illus.

Fokins [fökin']. Mikhail (1880-1942). Russ. dancer and choreographer; created for Diaghilev the ballets *Les Sylphides*, *Scheherazade*, *Petrouchka*, and others, 1-352.

FORESHORE

Fokker, Anthony H. G. (1890-1939), Dutch aeroplane designer; inventor of Fokker machines used by Germans in 1st World War, and of outstanding aircraft since that time; Fokker monoplane, 1-34 illus.; Fokker triplane, 1-35 illus.

Folio, size of book, 2-4.

Folkestone. Spt. and seaside resort in Kent, s.e. Eng.; pop. 45,200; fishing and shipping trade, 4-398.

Folk Lore, 3-405; the brothers Grimm, 4-98; fairies, 3-337; see also *Fairy Tales*; *Magic*; *Mythology*; *Stories and Legends*; *Superstitions*.

Folk Songs and Dances, 3-406.

Follies. Funnel shaped opening in skin from which hair grows, 4-118.

Fomalhaut. Star of the first magnitude, 7-146.

Fonseca, Gulf or Bay of, inlet of the Pacific bordering on San Salvador, Honduras, and Nicaragua; 40 m. long.

Fontainebleau [fontänblö']. Forest-girdled tn. and resort of N. Fr., 35 m. s.e. of Paris, on Seine; pop. 15,000; magnificent royal palace; revocation of Edict of Nantes (1685); abdication of Napoleon (1814); Barbizon, on N.W. edge of forest, made famous by painters of the Barbizon school, 3-410.

Fontenoy [fontunwah']. Village in w. Belgium, 45 m. s.w. of Brussels; scene of battle (1745) in War of the Austrian Succession in which Fr. defeated the Allies.

Fonteyn, Dame Margot (b. 1919). Stage name of Margaret Hookham, Brit. prima ballerina of Sadler's Wells ballet. Created D.B.E. in 1956.

Foochow or Minhow. Cap. of prov. of Fukien, China, on r. Min; cotton mills, timber yards, paper, match and spice factories. Pop. 400,000.

Food, 3-408; and aluminium containers, 1-128; canning and preservation, 2-210, 211; cookery, 2-495; diet and hygiene, 4-223; digestion, 3-89; etiquette at meals, 3-378; food preservation and antisepsis, 1-177; in Middle Ages, 5-152; proteins, 6-297; rice, 6-397; soya beans, 7-103.

Food and Agriculture Organization (F.A.O.). Body of the U.N., founded Oct. 1945, with 42 nations participating, to collect information on food supplies, help fair distribution, advise on crops and methods of agriculture.

Food preservation, canning, 2-210; preserving fish, 3-382; freezing, 3-465; jam, 4-336; pasteurisation, 5-207, 2-212, 6-95; refrigeration, 6-378.

Foot. Retainer kept in medieval times and up to 17th cent., by sovereigns and nobles for their entertainment. Also called a jester. Privileged by his supposed foolishness to criticise his patron without having to suffer for it; in early playing cards, 2-221.

Foot's gold, iron pyrites or iron disulphide, 7-187.

Foot. In anatomy, 3-412; skin of, 7-63; of mammals, 5-102; foot-binding in China, 2-366.

Foot. A unit of measurement, based upon that of a man's foot. The English statute foot is 12 in. long. See also *Weights and Measures* (list).

Foot and mouth disease. An infectious disease to which cattle and pigs are especially subject; characterized by fever, with ulcers about the mouth and feet; epidemics in Britain have resulted in great losses of livestock.

Football. Association and Rugby, 3-414.

Football Association. Governing body of Eng. football (Association) foundation and rules, 3-415.

Footings. See *Architectural Terms*.

Foot plough. A primitive agricultural tool, 1-71.

Foot-pound. The unit of work in the British or foot-pound-second system

of units. It is the amount of work done (energy expended) in raising a weight of one pound to a vertical distance of one foot against gravitation.

Foot-Poundal. Unit of energy in the foot-pound system of units. It is the work done by a force of one poundal acting through a distance of one foot.

Foot-Pound-Second. British system of physical units derived from the three fundamental units of length (foot), mass (pound), and time (second).

Forain, Jean Louis (1852-1931). Fr. artist and caricaturist; best known for his satirical black-and-white drawings in Paris journals.

Foraker, Mt. Peak in the Alaska Range, N. Amer. (17,000 ft.), 5-453.

Foraminifera. Order of single-celled water-dwelling animals with limy outer coats; in formation of chalk, 2-299, 6-298, 5-127 illus.

Forbes, Lough, Ireland; Shannon flows through, 7-16.

Forbes, (Joan) Rosita (b. 1893). Brit. explorer and author; travelled extensively in China, N. Africa, and other parts, *The Secret of the Sahara-Kufura*, 6-486.

Forbes, Stanhope Alexander (1857-1917). R.A., Brit. artist. Known as painter of village life and similar genre in academic style.

Forbes-Robertson, Sir Johnston (1853-1937). Brit. actor; first appeared with Irving and Mrs. Patrick Campbell; later as star in own company in *Hamlet*, and other Shakespeare plays; *The Light that Failed*, *The Passing of the Third Floor Back*, his daughter Jean (b. 1905) also achieved distinction as an actress.

Forbidden City, Peking, China, 6-107.

Forbidden City. A name given to Lhasa, cap. of Tibet, 7-273, 271.

Forbidden Fruit. In Bible story of the Fall, the fruit of the Tree of Knowledge by eating which Adam and Eve sinned and gained knowledge of good and evil, 1-15.

Force. That which, when acting on a body which is free to move, produces an acceleration in the motion of the body, or changes or tends to change any such motion. The unit of force, the dyne or poundal (q.v.) is that which produces unit acceleration in unit mass. Force can be muscular, gravitational, magnetic or electrical. And law of gravitation, 4-66.

Forces, Parallelogram of, 5-156 illus.

Forchheim, Ger. Historic tn. in Bavaria, 15 m. s.e. of Bamberg, residence of Carolingians, including Charlemagne.

Forcipiger longirostris. Tropical fish 5-128 illus. f.

Ford, Henry (1863-1947). Amer. motor vehicle manufacturer, 3-417; mass-production methods, 5-283; factory in England, 5-280-281, illus.

Ford, John (1586-c. 1639). Eng. dramatic poet; work characterized by dramatic beauty and intensity of passion; collaborated with Dekker, Rowley and Webster, 3-119.

Forecastle (fok'sl). Forward part of a ship's hull below the main deck, usually containing the crew's living quarters. Originally a raised platform on the bow of a medieval warship from which archers fired.

Foreign Exchange, 3-418; and gold standard, 4-13.

Foreign Legion, of France, in Algeria, 1-110.

Foreign Office. Brit. govt. dept. in Downing Street, London, which attends to state affairs connected with foreign countries; headed by secretary of state for foreign affairs (foreign secretary) and under sec., separate dept. since 1782, 4-52.

Forel, August (1848-1931). Swiss doctor and biologist; famous for work on mental disorders, and life of ants.

Foreshore. That part of a beach or seashore between the extreme limit

FORESTER

of high and low water. In Eng. law, *foreshore* is vested in the crown.

Forester, Cecil Scott (b. 1899). Brit. novelist; creator of the character Horatio Hornblower, naval officer in Napoleonic Wars; *The Gun*, 6-117.

Forestry. The work of developing and maintaining forests, 3-422; transplanting fir, 2-483 illus.; as a career, 2-236; beech as "nursemaid," 1-409.

Forests, 3-420; in Canada, 2-195; and formation of coal-seams, 2-426; in Congo and Zambesi basins, 1-50; depletion through use of charcoal in iron-smelting, 4-293; lightning and tropical forests, 4-506; lumbering, 5-49. *See also* Timber; Trees.

Forfar. Co. town of Angus, Scotland; pop. 10,000, 1-151.

Forfarshire. *See* Angus.

Forget-me-not (*Myosotis*), flowering plant, 3-422.

Fork. *See* Money (Table).

Forks. *See* Knives and Forks.

Form. A hare's nest, 4-132.

Formaldehyde. A gas, composed of carbon, hydrogen and oxygen, which will dissolve in alcohol or water; used in making plastic materials; 6-219-220.

Formaldehyde tannage, and imitation wash leather, 4-169.

Formalin. A 30 or 40 per cent. solution of formaldehyde in water. Powerful caustic and antiseptic. Used as a preservative.

Forme, in printing, 2-6, 7 illus., 5-404 illus.

Formentera. Span. isl. in the Mediterranean, one of the Balearic group; area 38 sq. m.; 1-349.

Formic acid. Colorless pungent liquid; atomic arrangement, 1-12; in ant sting, 1-160; in stinging nettles, 5-393.

Formicaries. Ant nests, construction, 1-162.

Formicidae. *See* Ant.

Formigny, battle of (1850), in Hundred Years' War, 4-201.

Formosa, or Taiwan. Isl. off S.E. coast of China, 3-423; as Chinese nationalist base, 2-333; under Jap. rule, 4-340, 4-350.

Formula. In chemistry, an expression denoting by means of letters and numbers, the number and arrangement of the atoms in a compound; in mathematics, an expression of a general rule or principle in algebraic symbols; types of chemical formulas, 2-317, 321; empirical and structural, in chemistry, 1-11.

Forres. Tn. of Morayshire, Scot.; pop. 5,230; 5-261.

Forrest, John, Baron (1847-1918). Australian surveyor, explorer, and statesman; first premier and treasurer of W. Australia (1890-1901); pres. Australian Federal Council (1897); introduced free homestead system; established Agricultural Land Bank; first Australian peer.

Forster, Edward Morgan (b. 1879). Brit. novelist. His book, *A Passage to India* (1924), is generally considered his finest work. Other works are *Howard's End* (1910), and *The Hill of Devi* (1933).

Forster, John (1812-76). Brit. biographer, essayist, and historian of the mid-Victorian period; biography of Dickens, 3-87.

Forster, William Edward (1818-86). Brit. Liberal statesman; active in educational interests; secretary for Ireland in Gladstone's cabinet (1880-82) at time of Phoenix Park murders. Framed and introduced the Education Act of 1870.

Forsyte Saga, The. Series of novels, by John Galsworthy, dealing with the Forsyte family and hygone middle-class life in England, 3-499.

Forsyth, Alexander (1769-1843). Scot. clergyman; and invention of percussion-cap gun, 3-359.

Forsythia. Deciduous shrub, family *Oleaceae*, native to Japan, China, grown outdoors in Gt. Brit. Height up to 12 ft. Long sprays of yellow flowers appear Feb.-March before the leaves.

Fort Churchill, Canada. *See* Churchill, Manitoba.

Fort Dearborn, U.S.A. Fort built in 1804 on site of present city of Chicago; murder of early settlers (1812), 2-334.

FORTUNATUS

Fort de France. Cap. of Martinique; pop. 66,006; 5-138.

Fort Duquesne (dûkân'), Fr. colonial fort in Pennsylvania, U.S.A., on site of present city of Pittsburgh, 6-209; Washington's expedition, 7-2.

Fortis. *See* Musical Terms (table).

Fort Frontenac (frontonah'k'l). Fr. colonial fort on site of present town of Kingston, Ontario.

Fort Garry. Former name of Winnipeg, Canada.

Forth. Scot. r. formed by two head streams rising near Ben Lomond; it flows 53 m. to the head of the Firth of Forth; 6-510, 7-158.

Forth Bridge. Over the Firth of Forth, Scotland; over 1½ m. long; main spans 1,710 ft., 2-64 illus.

Forth, Firth of. Scot. Estuary (50 m. long) of Forth r. on E. coast.

Fort Knox, Kentucky, U.S.A.; the U.S. Gold Bullion Depository is here storing over \$4,400,000,000 of gold, more than half total U.S. gold assets, 4-41.

Fort Lamy (lahmâ), cap. of Chad territory, Fr. Equatorial Africa, at S. edge of Sahara; pop. 6,000.

Fortrose. Tn. of Ross and Cromarty, Scot., pop. 882; 6-455.

Fort St. George. Settlement of East India Company, built in 1840; later known as Madras city, 4-252.

Fort Smith, North-West Territories, Canada, 5-461 illus.

Fort Sumter, in Charleston harbour, South Carolina, U.S.A.; scene of first engagement of American Civil War.

Fortuna. In Rom. myth., goddess of fortune, the Gk. Tyche; a goddess of chance, giver of prosperity, controller of destinies; shown with cornucopia, a rudder, a wheel or globe.

Fortunate Isles, or Isles of the Blest. Legendary islands of classical times, 1-295; identified with Canary Isles, 2-208.

Fortunatus [fortûn'âtus]. Hero of European folk-tale, possessor of proverbial inexhaustible "Fortunatus purse" and wishing-cap which would transport him wherever he desired to go.

SOME RECORDS IN FOOTBALL

Football Association Cup

Winners Most Times

Aston Villa and Blackburn Rovers have won the Cup 6 times, and The Wanderers (amateurs) won it 5 times.

Biggest Win in Final Tie

Bury 6 goals, Derby County nil, in 1902-03.

Greatest Number of Goals in Final Tie

Seven: Blackburn Rovers 6, Sheffield Wednesday 1; in 1900. Blackpool 4; Bolton Wanderers 3; in 1953.

Highest Score in Any Tie

In 1887 Preston North End beat Hyde in a F.A. Cup Tie by 26 goals to nil.

Medals

Lord Kinnaird, C. H. R. Wollaston, and J. Forrest each won 5 F.A. Cup winners' medals

Cup and League

Preston North End in 1888-89, and Aston Villa in 1906-97 won both the Cup and the League (First Division) in the same season.

No Goals Against

When Preston North End won the Cup and League in 1888-89 they did so without a goal being scored against them in the Cup competition and without losing a League match. Bury won the Cup in 1903 without a goal being registered against them in any of the ties.

Record Attendance

In 1923, 126,047 spectators (official return), saw Bolton Wanderers (2) beat West Ham United (0) at Wembley.

Successive Wins

The Wanderers and Blackburn Rovers each won the Cup in three successive years, the former in 1875-76, 1876-77, 1877-78, and the latter in 1883-84, 1884-85, and 1885-86.

Football League

Championship Record

Arsenal have won the League (Division I) Championship most times—seven

Individual Goal-scoring Record

"Dixie" Dean, of Everton, in season 1936-37 passed Stephen Bloomer's long-standing record of 352 goals in League football; his total at his retirement in 1939 was 379; in 1927-28 he scored 60 goals.

League and Cup

Winners of both in one season—see under *Cup and League*.

International Football

Record Attendance

In 1937, 149,547 spectators were admitted by ticket to see Scotland beat England 3-1 at Hampden Park, Glasgow.

Caps

W Wright (England) gained 51 International Caps; W Meredith (Wales) 51; R Crompton (England) 34; E. Scott (Ireland) 32; and A. Morton (Scotland) 30. Including both International and Amateur International matches, V. J. Woodward was capped 60 times. Including war-time (1939-45) games, Stanley Matthews played 73 times for England.

Miscellaneous

No Goals Against

During the first seven years of their existence Queen's Park (Glasgow) did not have a goal scored against them.

Record Score

36 goals to nil scored by Arbroath Against Bon Accord in a Scottish Cup Tie, Sept. 6, 1886; on the same day Dundee Harp defeated Aberdeen Rovers in the same competition by 36 goals to nil.

Won Every Match

In 1898-99 Glasgow Rangers won all their matches in the Scottish League.

FORTUNY

Fortuny, Mariano (1838-74). Span. painter and etcher, dazzling colourist, dominant influence in Span. art until rise of Impressionism; 7-121.

Fort Wayne, Indiana, U.S.A. Railway and trading centre in N.E. on Maumee r.; pop. 133,607; steam-engines, trucks, machinery; site of fort built by Gen. Anthony Wayne (1794).

Fort William, Ontario. Shipping centre at head of L. Superior; pop. 34,000; products include flour and iron ware.

Fort William. Founded 1701. Name of original settlement of East India Co., later renamed Calcutta, 4-252.

Fort William, Inverness-shire, Scot. holiday centre at foot of Ben Nevis; pop. 3,200; 4-275.

Fort Worth. City in Texas, U.S.A., pop. 278,778; market for cattle and grain; 7-260.

Forty-Five, The. Popular name for the Jacobite rising which took place in 1745. *See Jacobites.*

Forty Immortals. Name for members of French Academy, 1-9.

Forum. Open space in centre of a Rom. city used as market-place, for political assembly, amusements; at Rome, 6-435 illus.; *Forum Vetus*, Lyons, 5-56.

Foscarì (foškahrè), Francesco (1373-1457). Doge of Venice (1423-57); made war against Milan; with son Jacopo forms subject of Byron's tragedy *The Two Foscari*.

Foss Dyke. Roman ditch running from Lincoln to the Trent at Torksey; later a canal; 2-205.

Fosse Way. Ancient Roman military road running from Lincoln to Axminster.

Fossils. Organic bodies preserved in the strata of the earth's crust, 3-424; and study of evolution, 1-156, 3-321; fossil insects, 4-270; fossil kangaroos, 4-392; in geology, 3-515, 516; in limestone, 4-509; in marble, 5-120; and palaeontology, 1-451; prehistoric animals, 6-281; in sedimentary rocks, 6-424.

Foster, Stephen Collins (1826-64). Amer. song-writer; most famous works are *The Old Folks at Home*, *Massa's in De Cold*, *Cold Ground*, and *My Old Kentucky Home*; 4-399.

Foucault, Léon (1819-88). Fr. scientist; proved earth's rotation by pendulum and gyroscope, 4-113.

Foucault pendulum. A pendulum with a heavy bob hung on a long wire; its direction of swing appears always to deviate to the right (N. hemisphere), thus showing that the earth is rotating; first constructed by Léon Foucault (1819-68).

Fouché (fo'shà), Joseph (1759-1820). Duke of Otranto. Fr. politician, chief of police under Napoleon and minister of police under Louis XVIII; with extreme severity he quelled the revolt in Lyons.

Fougasse. Pseudonym of Cyril Kenneth Bird (b. 1887). Brit. comic artist. Editor of *Punch*, 1949-53. Drawings notable for extreme economy in detail, subtle wit, and a strong sense of the ludicrous in common experience.

Foundations. In building, 2-112.

Foundling Hospital. Charitable foundation to rescue deserted children; founded by Thomas Coram in 1741 in Hatton Gdn.; in 1745 moved to Guilford St., Bloomsbury; in 1935 to Berkhamsted; in 1951 became a mixed county modern secondary school called Ashlyns, with places for 200 boarders.

Fountain pen. 6-112; alloys in nibs, 1-115; special ink for, 4-261.

Fountains Abbey. Ruin in the W. Riding of Yorkshire, 3 m. s.w. of Ripon, largest and finest in Eng. The abbey was founded in 1132; 7-516 illus.

Fouquet (fo'kà), Jean (c. 1415-85). A skilful French miniature painter to the court of Louis XI, founder of a new school and famed for his

illuminated *History of t'c Jeus*, and *The Book of Hours*, 3-439.

Fouquet, Nicolas (1815-80). Superintendent of finance, and procureur-general under Louis XIV; patron of arts; amassed great fortune and power; put in prison for life.

Fouquier-Tinville (fookyà, tanvèl), Antoine Quentin (1747-95). Fr. revolutionist; public prosecutor during Reign of Terror; guillotined.

Fourah Bay College. Coll. of Sierra Leone, Africa, nr. Freetown; pioneer of university education in W. Africa, founded 1828; affiliated with Durham univ., 1876; has a university dept., a teacher training dept., and a technical vocational training dept.

Four-course rotation. In agriculture; method, 1-78.

Fourdrinier machine. paper-making on, 6-71.

Fourier (fo'ryà), François Charles Marie (1772-1837). Fr. Socialist and political economist; originator of the co-operative community plan known as "Fourierism," tried unsuccessfully at Brook Farm, Mass., U.S.A., and elsewhere.

Four-poster. Type of bed, 1-402, 403, 404.

Four-stroke internal-combustion engine. 4-273, 274.

"Fourteen Points." The terms of peace suggested by Pres. Wilson in 1918, in an address to Congress.

Fourth Coalition. in Napoleonic Wars, 5-320.

Fourth of July, or Independence Day. The holiday in U.S.A. celebrating Declaration of Independence (1776).

Fourvière. Hill west of Lyons, France; Rom. ruins, 5-55 with illus.

Four-wheel drive. in motor vehicle, 5-282 diag.

Fovea. Part of the retina of the eye where colour reception is concentrated, 2-464, 3-334.

Fowler, Henry Watson (1858-1933). Brit. lexicographer; at first with his brother E. G. Fowler, and later by himself, produced notable books on Eng. language (*The King's English*, *Concise Oxford Dictionary*, *Dictionary of Modern English Usage*).

Fowls. types of, 3-323; poultry breeding, 6-277.

Fox, Charles James (1719-1806). Brit. statesman, one of the greatest orators of his day, 3-426; and Sheridan, 7-26.

Fox, George (1621-91). Eng. religious leader; founder of the Quakers, 3-426, 6-316.

Fox and Foxhunting. 3-426; fur, 3-196.

Fox and the Grapes. The. Fable told by Aesop, 1-45.

Fox Channel. An arm of the ocean N. of Hudson Bay and W. of Baffin Island; named after Luke Fox who in 1631 explored the region; 4-200.

Foxe, John (1516-87). Eng. author and divine; his *Book of Martyrs* is one of the most celebrated books in the Eng. language, 5-139.

Foxe's Book of Martyrs (1563). Popular name for the *History of the Acts and Monuments of the Church* by John Foxe, 5-139.

Foxglove. *Digitalis purpurea*, tall many-flowered plant of order *Scrophulariaceae*, common in woods and by waysides in Brit.; yields the drug digitalis; anthers, 3-398; fertilisation, 2-24 diag.; section of ovary, 3-395 diag.

Foxhound. Breed of dog, 3-102, 101 illus. f. *See also Dogs* (list).

Fox shark. 7-18.

Fox terrier. Small breed of terrier of two types: smooth haired and wire-haired, 3-103, 100 illus. f. *See also Dogs* (list).

Fox-trot. Dance, 3-38.

Foyle, Ire. R. formed by the union of the Lifford and Mourne; forms part of boundary of Northern Ire. and Irish Rep., and expands into Lough Foyle; 16 m. long, 4-281, 5-34.

Foyle, Lough. Ire. Inlet of the Atlantic on the N. coast, between Donegal and Londonderry; 18 m. long; 6-34.

FRANCE

Fractionating column. device used in oil distilling, 3-94.

Fractionating units. in oil refining, 6-150.

Fractions. 3-428, 5-474; decimals, 3-57, 58.

Fracture. of bone, 1-518, 7-508 illus.

Fragonard (frag'nah'r), Jean Honoré (1732-1806). Fr. painter of the "roccoco period," whose gay, delicate paintings express the frivolous luxury of Louis XV's time, 3-439.

Fram. Name of Nansen's famous ship with which he tried to reach the North Pole, 6-316, 6-242.

Frame; in television, a single complete broadcast picture; 50 frames are usually broadcast per second; in cinema film, 24 per second.

Frame. *See Architectural Terms.*

Framing. *See Architectural Terms.*

Frampton, Sir George James (1860-1928). Brit. sculptor; Peter Pan statue, and Edith Cavell monument, London, are two of his best works, 1-372.

Franc. A silver coin weighing 5 grams; unit of monetary system in France, Belgium, Switzerland; and gold standard, 4-43.

France, Anatole. pen-name of Jacques Anatole Thibault (1844-1924). Fr. novelist and critic, most distinguished modern master of graceful humour and pure French style.

France. Republic of W. Europe, and chief component of the French Union created 1916; area 212,737 sq. m.; pop. 40,502,513; cap. Paris; 3-431; map, 3-312; flag, 3-381, illus. f.; geography, 3-310; population, 3-433.

Social life: ballet in 17th cent., 1-351; bear-hunting, 4-209; bull-fighting, 2-122; dances, 3-37; dolls, 3-104; exhibitions, 3-327; Feast of the Ash, 1-276; fireworks, 3-361; national anthem, 5-326.

Government and Law: 3-438; the Code Napoléon, 5-319; Declaration of the Rights of Man, 1-446; education, 3-438; and Andorra, 1-119, 150; police, 5-253; French Union, 3-438.

Agriculture and Industry: land tenure, 3-434; crops and vineyards, 3-436; fisheries, 3-379; textiles, 3-437; mining, 3-137; seaweed industry, 1-105 illus. f.; air-transport development, 1-85; roads, 6-408; franc and gold standard, 4-14.

Overseas Departments and Territories: Adèle land, 1-170; Algeria, 1-108; Fr. Equatorial Africa, 2-182; Fr. Guiana, 4-102; Fr. Somaliland, 7-81; Fr. West Africa, 7-140, 6-154; Guadeloupe, 4-100; Madagascar, 5-64; Martinique, 5-138; Pacific possessions, 6-31. *See also* names of chief towns, rivers, etc.

France, Art of. 3-439, 3-441-448 illus.; 6-31; Impressionism, 4-236, 247; Renaissance architecture, 6-387; sculpture, 6-524; embroidery, 3-238. *See also* articles on chief Fr. artists.

France, History of. 3-449, 3-314; invasions of Normen and Normandy, 5-449; serfdom, 7-65; Philip Augustus and the Crusades, 6-155, 6-398; extension of power in Middle Ages, 5-200; auc. foot measure, 8-414; army and eagle standard, 1-248, 3-145; Valois kings, 3-450; Louis XI's reign, 6-41, 2-309; Hundred Years' War, 4-203; battle of Crecy, 2-527; Agincourt, 1-68, 4-204, 4-163; Joan of Arc, 4-376.

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Age of Louis XIV and the Old Regime: wars of Louis XIV, 5-42, 1-484, 5-132; palace of Versailles

GREAT FIGURES IN FRENCH LITERATURE

- Jean Anouilh** (1910-), dramatist—"L'Invitation au Château"; "Ardèle"; "Colombe."
- Louis Aragon** (1895-), novelist and poet—"Les Beaux Quartiers"; "Feu de Jole"; "Le Crève-cœur."
- Honoré de Balzac** (1799-1850), novelist—"Eugénie Grandet"; "Le Père Goriot"; "La Cousine Bette."
- Henri Barbusse** (1873-1935), novelist—"Le Feu (Under Fire)."
- Maurice Barrès** (1862-1923), novelist—"Le Culte du Moi"; "Les Déracinés"; "Colette Baudouche"; "Un Jardin sur l'Oronte"; "La Colline Inspirée."
- Charles Baudelaire** (1821-67), poet—"Les Fleurs du Mal"; "Les Paradis Artificiels."
- Henri Louis Bergson** (1869-1941), philosopher—"L'Evolution Créatrice"; "Matière et Mémoire."
- Bernardin de Saint-Pierre** (1737-1814), novelist—"Paul et Virginie."
- Nicolas Boileau** (1636-1711), satiric poet—"L'Art Poétique"; "Satires."
- Paul Bourget** (1852-1935), novelist and poet—"Le Disciple"; "L'Emigré"; "Un Divorce"; "La Duchesse Bleue."
- René Boylesve (René Tardivieux)** (1867-1926), novelist—"Le Parfum des Iles Borromées"; "L'Enfant à la Balustrade."
- Georges Louis Leclerc, Comte de Buffon** (1707-88), naturalist—"Histoire Naturelle."
- Paul Claudel** (1868-), dramatist and poet—"L'Otage"; "L'Annonce faite à Marie."
- Jean Cocteau** (1891-), poet, novelist, essayist, dramatist—"La Machine Infernale"; "La Belle et la Bête."
- Philippe de Commines** (c. 1445-1511), chronicler—"Mémoires."
- Pierre Corneille** (1606-84), dramatist—"Le Cid"; "Horace"; "Le Menteur."
- René Descartes** (1596-1650), philosopher—"Discours de la Méthode"; "Principia Philosophiae"; "Le Monde."
- Denis Diderot** (1713-84), encyclopedist—"L'Encyclopédie" (joint-editor with Jean d'Alembert); "Le Neveu de Rameau"; "Jacques le Fataliste."
- Georges Duhamel (Denis Ténévénin)** (1881-), essayist, novelist, and poet—"Lettres au Patagon"; "Deux Hommes"; "Journal de Salavin."
- Alexandre Dumas, the elder** (1802-70), novelist—"Les Trois Mousquetaires (The Three Musketeers)"; "Vingt Ans Après"; "Le Comte de Monte Cristo."
- Alexandre Dumas, the younger** (1824-95), novelist—"La Dame aux Camélias."
- François de Salinas de la Mothe Fénelon** (1651-1715), essayist—"Télémaque."
- Gustave Flaubert** (1821-80), novelist—"Madame Bovary"; "Salammbo"; "L'Education Sentimentale."
- Anatole France (Jacques Anatole Thibault)** (1844-1924), novelist and critic—"L'Île des Pingouins"; "L'Étui de Nacre"; "Le Crime de Sylvestre Bonnard"; "La Révolte des Anges"; "Thaïs"; "La Rôtisserie de la Reine Pédauque."
- Jean Froissart** (c. 1337 c. 1410), chronicler—"Chroniques."
- Théophile Gautier** (1811-72), novelist and poet—"Emaux et Camées"; poems; "Mademoiselle de Maupin"; novel.
- André Gide** (1869-1951), novelist—"Nourritures Terrestres"; "Les Caves du Vatican"; "Les Faux Monnayeurs"; "L'Immoraliste"; "Si le Grain ne Meurt."
- Jean Giraudoux** (1882-1944), dramatist and novelist—"Juliette au Pays des Hommes"; "Bella"; "Lectures pour une Ombre"; "Siegfried"; "Electre."
- Edmond and Jules de Goncourt** (1822-96, 1830-70), novelists and historians—"Renée Maupérin"; "Germinie Lacerteux"; "Journal des Goncourt."
- Victor Marie Hugo** (1802-85), novelist—"Notre Dame de Paris"; "Les Misérables"; "Les Châtiments."
- Joris Karl Huysmans** (1848-1907), novelist—"A Rebours"; "En Route"; "La Cathédrale."
- François Jammes** (1868-1938), poet—"Quatorze Prières"; "Le Roman du Lièvre"; "Quatrain."
- Jean de Joinville** (1224-c. 1318), historian—"Histoire de Saint Louis."
- Jean de La Bruyère** (1645-96), essayist—"Caractères."
- Jean de La Fontaine** (1621-95), fabulist and poet—"Fables"; "Contes et Nouvelles."
- Alphonse de Lamartine** (1790-1869), poet—"Méditations Poétiques"; "Jocelyn"; "Histoire des Girondins."
- François, Duc de La Rochefoucauld** (1613-80), maxim writer—"Maxims."
- Pierre Loti (Louis Marie Julien Vialat)** (1850-1923), novelist—"Pêcheur d'Islande"; "Madame Chrysantheine."
- Pierre Louÿs** (1870-1925), poet—"Les Chansons de Bilitis"; "Aphrodite"; "Les Aventures du Roi Pausole."
- François de Malherbe** (1555-1628), poet—"Odes"; "Stances."
- Stéphane Mallarmé** (1842-98), poet—"L'Après-midi d'un Faune"; "Vers de Circonstance."
- Jacques Maritain** (1882-), philosopher—"La Philosophie Bergsonienne"; "Religion et Culture"; "Questions de Conscience."
- Clément Marot** (c. 1487-1544), poet—"Les Epîtres"; "Blasons."
- Roger Martin du Gard** (1881-), essayist and novelist—"Jean Barois"; "Les Thibault."
- Guy de Maupassant** (1850-93), novelist and short story writer—"Bel Ami"; "La Maison Tellier"; "Contes de la Bécasse"; "Une Vie"; "Boule de Suif."
- François Mauriac** (1885-), novelist—"Le Baiser au Léprieux"; "Génétrix"; "La Fin de la Nuit"; "Thérèse Desqueyroux."
- André Maurois (Emile Herzog)** (1885-), novelist and biographer—"Ariel" (a life of Shelley); "Les Silences du Colonel Bramble"; "Climats"; "Edouard VII et son Temps."
- Prosper Mérimée** (1803-70), novelist, historian, and critic—"Columba"; "Carmen."
- Molière (Jean Baptiste Poquelin)** (1622-73), comic dramatist—"Tartuffe"; "Le Bourgeois Gentilhomme"; "Le Malade Imaginaire."
- Michel de Montaigne** (1533-92), essayist—"Essais."
- Charles Louis de Montesquieu** (1689-1755), historian and satirist—"Lettres Persanes"; "L'Esprit des Lois."
- Henri de Montherlant** (1896-), novelist—"Les Bestiaires"; "Les Célibataires"; "Les Jeunes Filles."
- Paul Morand** (1889-), novelist—"Ouvert la Nuit"; "L'Europe Galante"; "Londres."
- Alfred de Musset** (1810-57), dramatist, novelist, and poet—"La Confession d'un Enfant du Siècle"; "On ne Badine pas avec l'Amour."
- Blaise Pascal** (1623-62), philosopher—"Pensées"; "Lettres Provinciales."
- Marcel Proust** (1871-1922), novelist—"A la Recherche du Temps Perdu"; series, including "Du Côté de Chez Swann"; "A l'ombre des Jeunes Filles en Fleur"; "Le Côté de Guermantes"; "Sodomie et Gomorrie"; "La Prisonnière"; "Albertine Disparue"; "Le Temps retrouvé."
- François Rabelais** (c. 1490-c. 1553), satirist—"Gargantua et Pantagruel."
- Jean Racine** (1639-90), dramatist—"Athalie"; "Phèdre"; "Britannicus"; "Andromaque."
- Henri de Régnier** (1864-1936), novelist and poet—"Tel Qu'on Songe"; "La Sandale Allée"; "Le Miroir des Heures"; poems; "Le Passé Vivant"; "La Pêcheresse"; novels.
- Ernest Renan** (1823-92), philosopher and religious historian—"Origine du Christianisme," which includes "La Vie de Jésus."
- Romain Rolland** (1866-1945), novelist, and critic—"Jean Christophe"; "Colas Breugnot"; "Mahatma Gandhi"; "Au-dessus de la Mêlée."
- Jules Romains (Louis Farigoule)** (1895-), dramatist and novelist—"Knock," play; "Les Hommes de Bonne Volonté," series of novels.
- Pierre de Ronsard** (1524-85), poet—"Sonnets"; "Amours."
- Edmond Rostand** (1868-1918), dramatist and poet—"Cyrano de Bergerac"; "L'Aiglon"; "Chantecler"; "Les Musardises"; poems.
- Jean Jacques Rousseau** (1712-78), philosopher—"Le Contrat Social"; "La Nouvelle Héloïse"; "Émile"; "Les Confessions."
- Charles-Augustin de Sainte-Beuve** (1801-69), poet, historian and critic—"Causeries du Lundi."
- Louis de Rouvroy, Duc de Saint-Simon** (1675-1755), memoir writer—"Mémoires."
- Albert Samain** (1858-1900), poet—"Au Jardin de l'Infante"; "Le Chariot d'Or."
- George Sand (Lucile Aurore Dudevant, née Dupin)** (1804-76), novelist and letter writer—"Consuelo"; "Le Marquis de Villemer"; "Histoire de ma Vie."
- Jean Paul Sartre** (1905-), novelist and dramatist—"Le Chemins de la Liberté"; novels; "Huis-Clos"; "Morts Sans Sépulture" (plays).
- Madame de Sévigné** (1626-96), letter-writer—"Lettres."
- Madame de Staël** (1766-1817), novelist—"Delphine"; "Corinne."
- Stendhal (Marie Henri Beyle)** (1783-1842), novelist and critic—"Le Rouge et le Noir"; "La Chartreuse de Parme."
- Hyppolyte Adolphe Taine** (1828-93), philosopher, historian, and critic—"Histoire de la Littérature Anglaise"; "Les Origines de la France Contemporaine."
- Paul Valéry** (1871-1945), poet and essayist—"La Jeune Parque"; "Fragments du Narcisse"; "Variétés," essays.
- Paul Verlaine** (1844-96), poet—"Fêtes Galantes"; "La Bonne Chanson"; "La Sagesse"; "Confessions."
- Alfred de Vigny** (1797-1863), novelist, dramatist, and poet—"Cinq-Mars"; "Servitude et Grandeur Militaires."
- Geffroi de Villehardouin** (c. 1155-1213), chronicler—"Histoire de la Conquête de Constantinople."
- François Villon** (b. c. 1431), poet—"Le Petit Testament"; "Le Grand Testament."
- Voltaire (François Marie Arouet)** (1694-1778), philosopher, satirist, and dramatist—"Oedipe"; "Le Siècle de Louis XIV"; plays; "Candide," satirical tale.
- Emile Zola** (1840-1902), novelist—"Rougon-Macquart" series, including "L'Assommoir"; "Germinal"; "La Débâcle."

FRANCE

7-394; War of the Austrian Succession (1740-48), 1-326, 5-125; Seven Years' War, 7-2; struggle and loss of power in India, 4-252, 2-411. *French Revolution and Napoleon*: 2-466; Marie Antoinette, 5-125; Louis XVI, 5-43; Napoleon, 5-318; Peninsular War, 6-116; battle of Trafalgar, 7-304, 5-303, 5-350; Waterloo, 1-260. *See also* article *French Revolution*.
1815 to *Present Day*: Louis XVIII and restoration of the Bourbon line, 5-43; Louis Philippe and revolution of 1830, 5-44, 4-437; Napoleon III and the Second Empire, 5-323; Franco-Prussian War, 3-458; and Corsica, 2-512; and Mexico, 5-189; and Morocco, 5-265; 1st World War, 7-478; Versailles Treaty, 7-484; 2nd World War, 7-478, 486; de Gaulle and Free French, 3-511; Normandy invasion, 5-450.
French, Language and Literature, 3-453; influence on Eng. vocabulary, 3-232; activities of Fr. academy, 1-9; language in Alsace-Lorraine, 1-127; days of week, 3 55; drama, 3-119; novel, 5-472; Racine, 6-334; Hugo and the Romantic Movement, 4-201. *See also* articles on chief Fr. writers.
Francesca, Piero della (c. 1423-92). It. painter; the *Nativity*, 4-318, 319 illus.
Francesca da Rimini (franhche's'ka dah rē'mīnē) (died 1285). Wife of Malatesta of Rimini, wife, falling in love with her husband's brother, Paolo, was killed by her husband; story told in Dante's *Inferno*.
Franché-Comté (franhsh kōntē), old prov. in E. Fr. in Rhône basin, now depts. of Doubs, Haute-Saône, Jura, and part of Ain; conquered by Louis XIV in 1668.
Franchise. *See* Ballot; Election; Vote.
Francis (frahn'cha) (c. 1450-1517). (real name Francesco Raimbaldi), It. painter, chief master of the Bolognese school; though deficient in composition, his pictures charm by their peaceable lyric sentiment and lovely landscapes.
Francis, José Gaspar Rodríguez da (1757-1840), dictator of Paraguay (1813-40), austere, gloomy, ruthless despot.
Francis (Borgia), St. (1510-72). Member of the Borgia family, 2-18.
Francis de Sales (sahl), St. (1567-1622), Fr. churchman, Bishop of Geneva; his book, *Introduction to the Devout Life*, has been translated into almost every modern language, and is probably more widely read than any devotional work except the *Imitation of Christ*.
Francis of Assisi, St. (c. 1182-1226). Founder of Franciscan order, 3-456.
Francis I (1708-65). Holy Rom. emperor; husband of Maria Theresa, Empress of Austria, 5-125, 4-130.
Francis II (1768-1835). Holy Rom. emperor and emperor of Austria-Hungary; dissolves Holy Rom. empire, 4-8, 4-188, 1-322, 4 130.
Francis I (1494-1547). King of Fr. 1515-47; patron of art and learning; Leonardo in service of, 4 483; rival of emp. Charles V in Italy, 4-314; defeated and captured at Pavia, 1525; renowned struggle, 1336; 2-450; at Field of the Cloth of Gold, 4-163; interest in eastern trade, 1-135, 136.
Francis II (1544-60). King of France; married Mary Queen of Scots, 5-141.
Francis II (1836-94). King of the Two Sicilies; in Bourbon line, 2-28.
Francis, Sir Philip (1740-1818). Brit. politician, reputed author of the *Letters of Junius*; hostility to Warren Hastings, 4-136.
Franciscans, Order of, also called Minorites, religious order of friars, founded by St. Francis, 3-457; and Oxford univ., 6-17.
Francis Ferdinand (1863-1914). Archduke of Austria-Hungary, whose assassination at Sarajevo led to the outbreak of the 1st World War, 6-523, 1-326, 7-478.

RULERS OF FRANCE CAROLINGIAN LINE

768-814 Charlemagne
814-840 Louis I, the Pious
840-877 Charles I, the Bald
877-879 Louis II
879-883 Louis III
879-884 Carloman } *Joint*
884-887 Charles II, the Fat
[888-893] Odo of Anjou
893-922 Charles III, the Simple
[922-923] Robert I of Anjou
[923-936] Rudolph of Burgundy
936-954 Louis IV
954-986 Lothair
986-987 Louis V

CAPETIAN LINE

987-996 Hugh Capet
996-1031 Robert I
1031-40 Henry I
1060-1108 Philip I
1108-37 Louis VI, the Fat
1137-80 Louis VII
1180-1223 Philip II, Augustus
1223-26 Louis VIII
1226-70 Louis IX, the Saint
1270-85 Philip III
1285-1314 Philip IV
1314-18 Louis X
1316-22 Philip V
1322-28 Charles IV

VALOIS LINE

1328-50 Philip VI
1350-64 John II
1364-80 Charles V
1380-1422 Charles VI
1422-61 Charles VII
1461-83 Louis XI
1483-98 Charles VIII
1498-1515 Louis XII
1515-47 Francis I
1547-59 Henry II
1559-60 Francis II
1560-74 Charles IX
1574-89 Henry III

BOURBON LINE

1589-1610 Henry IV
1610-43 Louis XIII
1643-1715 Louis XIV
1715-74 Louis XV
1774-92 Louis XVI

THE FIRST REPUBLIC

[1792-93 The Convention]
[1793-99 The Directory]

THE CONSULATE

1799-1804 Napoleon Bonaparte, First Consul

THE EMPIRE

1804-15 Napoleon I

THE BOURBON RESTORATION

1814-24 Louis XVIII
1824-30 Charles X
1830-48 Louis Philippe

THE SECOND REPUBLIC

1848-52 Louis Napoleon

THE SECOND EMPIRE

1852-70 Napoleon III (Louis Napoleon)

THE THIRD REPUBLIC

1871-73 Adolphe Thiers
1873-79 Marshal MacMahon
1879-87 Jules Grévy
1887-94 M. F. Sadi-Carnot
1894-95 J. P. Casimir-Férier
1895-99 Félix Faure
1899-1906 Emile Loubet
1906-13 Armand Fallières
1913-20 Raymond Poincaré
1920 Paul Deschanel
1920-24 Alexandre Millerand
1924-31 Gaston Doumergue
1931-32 Paul Doumer
1932-40 Albert François Lebrun
1940-44 German Domination
1941-47 Provisional Government

THE FOURTH REPUBLIC

1947-54 Vincent Auriol
1954 René Coty

FRASER

Francis Joseph (1830-1916). Emp. of Austria and King of Hungary, 1948-1916; inaugurated Dual Monarchy 1867-1916; retained much personal power though sympathetic to constitutional govt.; reign a period of Austrian decline; personal tragedies, suicide of son Rudolf (1889), and assassination of wife (1898); 1-326; and rise of Prussia, 4-130.
Francium (Fr.). Chem. element; at. no. 87; at. weight 223; 3-224.
Frank, César (1822-90). Fr. (Belgian-born) composer; work as an organist influenced all his music; *Symphonic Variations* for piano and orchestra; symphony; and "Les Béatitudes," an oratorio.
Francó, General Francisco (b. 1892). Dictator of Spain, 3 457; in Span. civil war, 7-110; declaration on royal succession, 2-28.
Frankonia ("land of the Franks"). Medieval Ger. duchy chiefly E. of Rhine, in valley of Main.
Franco-Prussian War (1870-71), 3-458, 3 453; Bismarck and, 1 175; fighting at Metz, 5 185; Sedan, 5-180, Fr. govt. at Bordeaux, 2-17.
Frankenstein, student in Mary Shelley's novel *Frankenstein*, who fashions a soulless man-monster, repulsive yet yearning for sympathy, pursuing its creator from one land to another and complaining of its loneliness.
Frankfort (on-the-Main). City of W. Germany, in the *Land of Hesse*; pop. 532,027; 3 459.
Frankfort Treaty, terminating Franco-Prussian War (1871), 3 459.
Frankfort Diet. Parliament of German Confederation; Bismarck and, 1 174.
Frankfort (on-the-Oder). * Tu and river port of E. Germany on left bank of riv. Oder, 50 m. E.S. of Berlin; pop. 75,000. A suburb on the right bank, Slubice, was transferred to Polish admin in 1914; 3-459.
Frankfort. Cap. of Kentucky, U.S.A. pop. 11,916; 4-499.
Frankfurter Zeitung (Frankfurt Journal). The first regular weekly newspaper, 5-107.
Frankincense. Fragrant gum obtained from trees of genus *Boswellia* abundant on the Somali coast and in S. Arabia. When burnt gives off powerful scent. Used in making perfume and church incense.
Frankland, Sir Edward (1825-99). Brit. chemist and physicist, formulator of the doctrine of chemical valency and discoverer (with Lockyer) of helium.
Franklin, Benjamin (1706-90). Amer. scientist, statesman and writer, 3 460; electrical experiments and theories, 3-210, 211; improved lamp wick, 4-413; and lightning conductor, 4 505; his kite, 4-117; invented bifocal spectacles, 7 120; as benefactor to Philadelphia, 6-153; and first Amer. magazine, 7 363.
Franklin, Sir John (1786-1847). Eng. lish explorer; governor of Van Diemen's Land (Tasmania) 1836-43, 3-461; expedition to seek north west passage, 6 212, 2 400.
Franks. European tribes of Teutonic origin, who founded the Kingdom of France; migrations and invasions, 5-202, 5-199; Frankish empire, 3-313, 3-449; Carolingian line and Charlemagne, 2-305.
Frantz-Joseph glacier, N. Zealand, 4-2; illus., 5-424 illus.
Fraser of North Cape, Bruce Austin Fraser, Baron (b. 1888). Brit. sailor in 1943 C.-in-C. Home Fleet; on Dec. 26, 1943, sank *Scharnhorst* off North Cape; adm. in 1944; 1945-46 commanded Brit. Pacific Fleet; 1946 made baron; in 1948 1st Sea Lord and Adm. of Fleet.
Fraser, Sir Ian (William Jocelyn Ian) (b. 1897). Brit. politician, blinded in 1st World War; chairman of St. Dunstan's from 1921; famous for great work on behalf of the blind esp. those blinded in war; 1-488. Knigted in 1934.

FRASER •

Fraser, Marjorie Kennedy (1857-1930). Scottish writer and musician; collected Hebridean folk-songs.

Fraser, Peter (1884-1950). N.Z. statesman; emigrated to N.Z. in 1910; Labour prime minister, 1940-49.

Fraserburgh. Spt. of Aberdeenshire, Scot. Centre of the Scot. herring fisheries; pop. 10,847; 1-5.

Fraser River, Canada. chief r. of Brit. Columbia; two forks unite nr. Fort George, flowing S. 785 m. into Strait of Georgia; gold deposits; 2-80.

Frates Pontis (Brothers of the Bridge). Monastic order devoted to bridge-building, 2-66.

Fraunhofer (frown'höfer), Joseph von (1787-1826), Ger. optician and physicist; discovered dark lines of absorption spectrum, 7-127, 128 illus. f.

Fray Bentos. Tn. in Uruguay, has one of the largest beef-extract factories in the world, 7-370.

Frazer, Sir James George (1851-1941). Brit. anthropologist; author of *The Golden Bough*, a study of comparative religion, mythology, and folk lore; 3-461.

Frechette, Louis Honoré (1839-1908), Fr.-Canadian poet; lyrics show intense patriotism, love of Nature, friendship and family (*Veronica*, a tragedy; *Papineau* and *Félix l'outré*, historical plays).

Frederick I, Barbarossa (c. 1121-90). Holy Rom. emperor, 1155, and Ger. king, 1152; nicknamed Barbarossa (red-beard); in Ger. a successful ruler, in Italy defeated by Lombard League and opposed by Pope Alexander III; 4-7, destruction of Milan, 6-205; death on third Crusade, 3-2.

Frederick II (1194-1250). Holy Rom. emperor, 1220, Ger. king, 1215, King of Sicily, 1198; grandson of Barbarossa; nicknamed Stupor Mundi (Wonder of the World); his court in Sicily, 7-50, 4-329; in conflict with the Pope in Italy, thus neglecting Germany, which began to lose cohesion, 4-7, 4-313; and Crusades, 3-2.

Frederick III (1415-93). Holy Rom. emperor, and Ger. king; an incompetent ruler, last emperor to be crowned in Rome; portrait, 4-129.

Frederick III (1609-70), King of Denmark; he transformed Denmark into an absolute monarchy and made crown hereditary; unsuccessful wars with Sweden (1657-60).

Frederick VI (1768-1839). King of Denmark and Norw.; succeeded 1808 (previously regent); joined Armed Neutrality of North and was punished (1801) by destruction of fleet by Eng.; suffered similarly for neutrality again in 1807; then allied himself with Napoleon and was compelled by Allies (1814) to surrender Norway and Sweden.

Frederick VII (1808-63), Denmark. Succeeded 1848; in his reign Schleswig-Holstein troubles led to Bismarck's action in next reign.

Frederick VIII (1843-1912), Denmark, succeeded in 1906; father of Haakon VII of Norway, brother of King George I of Greece, and of Queen Alexandra of U.K.

Frederick IX (b. 1899), Denmark. Succeeded in 1947, 3-75.

Frederick I (1657-1713). First King of Prussia (1701), previously Elector of Brandenburg (1688-1701), and Duke of Prussia; patron of learned men, but vain and extravagant; gained title of king for aiding Emperor Leopold I in War of Sp. Succession; 6-299.

Frederick II, the Great (1712-86). King of Prussia, 3-462, 4-3; expansion of Prussia, 6-299; and War of Austrian Succession, 1-336; and Maria Theresa, 6-125; and Seven Years' War, 7-2; and Blücher, 1-494; army improvement, 1-248; French influences on, 3-431.

Frederick III (1831-88). King of Prussia; Ger. emperor (March 9 to June 15, 1888); son of William I,

first Ger. emperor, father of William II; commanded at Sedan and siege of Paris in Franco-Prussian War.

Frederick I, the Victorious (1435-76). Elector palatine (1451-76); tried to dethrone Emperor Frederick III; great military leader.

Frederick II, the Wise (1482-1556). Elector palatine (succeeded 1544); commanded imperial army at siege of Vienna in 1529; became Protestant through influence of Melancthon.

Frederick III, the Pious (1515-76). Elector palatine (succeeded 1559); laid foundation for systematic Calvinism; aided Fr. Huguenots.

Frederick IV, the Upright (1574-1610). Elector palatine (succeeded 1583), firm supporter of Protestantism.

Frederick V (1596-1632). Elector palatine and "winter king" of Bohemia; through his marriage with Elizabeth, daughter of James I of Eng., ancestor of the Windsor (Hanover, Saxo-Coburg-Gotha) line of Brit. kings; King of Bohemia 1610-20, thereafter in exile, 7-269; supplanted by Ferdinand II, 1-504.

Frederick III, the Wise (1463-1525). Elector and Duke of Saxony; refused imperial throne (1519) and suggested election of Charles V; friend of Luther and Melancthon, whom he invited to teach at Univ. of Wittenberg founded by him.

Frederick Augustus I (1750-1827). King of Saxony; he was an ally of Napoleon, who made him King and Grand Duke of Warsaw.

Frederick Henry (1584-1647). Prince of Orange; youngest son of William the Silent and brother of Maurice of Nassau; ended the 80-year struggle with Sp. by the treaty of Münster (1648); his term as Stadtholder (1625-47) is accounted the golden age of the Dutch Republic.

Frederick William I (1688-1740). King of Prussia; succeeded in 1713; in history of Prussia, 6-290.

Frederick William II (1744-97). King of Prussia, succeeding his uncle Frederick the Great in 1786; his reign saw a decline in Prussia's power.

Frederick William III (1770-1840). King of Prussia; succeeded in 1797; good, weak man under whom Prussia was almost effaced by Napoleon, but restored by Congress of Vienna and rehabilitated by the great ministers Stein and Hardenberg; member of Holy Alliance; his queen, Louise, a heroine of modern Ger.

Frederick William IV (1795-1861). King of Prussia; succeeded 1840; reactionary idealist; reluctantly granted Prussian constitution following revolutionary risings of 1848.

Frederick William (1620-88). The "Great Elector" of Brandenburg and Duke of Prussia; succeeded 1640; laid foundation of greatness of Prussia, previously ruined by Thirty Years' War; 6-299.

Frederick William (1882-1951). Crown Prince of Ger. until his father's abdication in 1918; commander of Fifth Ger. Army in 1st World War, when he was known to the Allies as "Little Willie."

Fredericksburg, Battle of. Important battle in American Civil War (1862), between Confederates under Lee and Federals under Burnside, ending in the victory of the former; remarkable in military history as exhibiting power of passive defence when time has been allowed for entrenching.

Fredericton, New Brunswick. Cap. and rly. centre on St. John r.; pop. 16,018; makes boots and shoes, boats, lumber, cotton; coal-mining; provincial univ.; 5-364.

Federikshald, formerly Halden, Norway. Fortified spt. on Idde Fjord; pop. 11,000; timber trade; Charles XII of Sweden was killed here during siege in 1718.

Federikstad, Norway. Spt. and mfg. tn. at mouth of r. Glommen, 50 m. S.E. of Oslo; pop. 14,000; export lumber trade; Hanko, most fashionable Norwegian resort, near by.

FRENCH REVOLUTION

Freeboard. See Nautical Terms (table).

Free Churches, 3-463; and Christmas festival, 2-382.

Free Church of Scotland, 3-461.

Freedom of the City. Honour with no material benefits except in London where only a freeman can be Lord Mayor, and certain charitable funds are available to freemen and their dependents. Can be obtained by apprenticeship to a freeman, by inheritance, by purchase, or as honorary gift from the city. Medieval privileges included freedom from certain taxes and military service.

Free Kirk. Name given to the Free Church of Scot., 4-414.

Freeman, Edward Augustus (1823-92). Brit. historian, 3-291.

Freemasonry, 3-464.

Free ports. Ports or specified areas within ports wherein imported goods may be stored, transferred from ship to ship, or used in manufacturing for export sale, without levy of customs duties.

Freesia. Bulbous plant of the family Iridaceae, native to S. Africa. Height up to 2 ft. Grass-like leaves. Funnel-shaped scented flowers. Several varieties.

Freetown. Spt. of W. Africa, cap. of Brit. colony of Sierra Leone; pop. 70,000; exports rubber, palm oil, gums, nuts, ginger; 7-66, 7-440.

Free Trade. Trade free from all restrictions. Economic doctrine which advocates equality of treatment of a commodity in the matter of taxation, whether produced at home or abroad. Gr. Brit. abandoned free trade in 1932; 2-487.

Freeze-drying. Method of preserving blood-plasma, penicillin and other medical preparations, 7-373.

Freezing, 3-465, 7-424; glycerine as anti-freeze in water, 4-37. See also Refrigerator.

Freezing point. The temperature of a liquid at which it begins to solidify under a given pressure (usually atmospheric); of mercury, 5-174; of water, 4-148.

Freiburg-im-Breisgau (frlboorg ðm brl'gau). City of W. Ger., in the Land of Baden-Württemberg; pop. 109,717; architecture, 4-479.

Freemantle. Port at mouth of Swan r., Western Australia; saw mills and iron foundries; port of call for mail steamers; pop. 30,000; 6-138, 7-442.

Frémiet (fré'myã), Emmanuel (1824-1910). Fr. classic sculptor noted for animal studies.

Frémont, John Charles (1813-90). Amer. general and explorer; demonstrated the practicability of a route over the Rocky Mts.; made first scientific exploration of Pacific coast.

French Academy. Fr. literary and linguistic institution, founded by Richelieu, 6-400, 1-9.

French bean, vegetable, 1-390.

French Equatorial Africa. Region previously known as the French Congo; includes Middle Congo, Gaboon, Ubangi-Chari and Chad; area 969,118 sq. m.; pop. 4,406,520; 2-182.

French Foreign Legion, 4-476.

French Guiana. Dept. of Fr. in S. Amer.; area 34,700 sq. m.; pop. 28,537; cap. is Cayenne; 4-102.

French Guinea. Territory of Fr. West Africa; area 96,500 sq. m.; pop. 2,262,000; cap. Konakry, 7-440.

French horn. Musical instrument, 4-194.

French (lang.). See France, Language and Literature.

French marigold. Flower, native to Mexico, 5-126.

French polishing, invention and use, 3-494, 4-434.

French Revolution (1789-95), 3-466, 3-451; Burke and, 2-129; calendar, 5-255; history by Carlyle, 2-243; Danton, 3-47; Fr. European conquests, 3-315; the Jacobins, 4-334; Lafayette, 4-437; Louis XVI, 5-43; Marat, 5-120; Marie Antoinette, 5-125; the "Marseillaise," 5-326;

Miraboon, 5-224; Napoleon I, 5-318; Robespierre and the Reign of Terror, 6-414; Influence of Rousseau, 6-469; salt tax, 6-491; States-General, 6-467, 5-224; Talleyrand-Périgord, 7-220.

French Somaliland. Territory in N.E. Africa bordering Gulf of Aden; area 3,071 sq. m.; pop. 35,770; chief tn. Djibouti; 7-84.

French Sudan. See Sudan.

French Union. Since 1946 the inclusive name for the Fr. Republic, her overseas departments and associated states and territories, 3-131, 438; associated states in Indo-China, 4-257, 7-309.

French West Africa. Comprises the territories of Senegal, Mauritania, Fr. Guinea, Fr. Sudan, Niger, Ivory Coast, Dahomey, Upper Volta, Dakar; area, 1,815,788 sq. m.; pop. 16,171,000; cap. Dakar; 6-485, 7-140.

Frenchman. Variety of rose, 6-453 illus.

Fron's son, Gustav (1863-1915). Ger. novelist; *Jörn Uhl*, strong novel of peasant life, made him famous.

Frequency. In physics, the number of vibrations per second of any vibrating wave motion. The rate of frequency is found by dividing the velocity by the wavelength. In electrical engineering, the number of cycles which an alternating current completes per second; 3-213; of electro-magnetic waves, 6-340; in radio, 7-132.

Frequency control, and piezo-electricity, 6-196.

Frere, Sir (Henry) Bartle (1815-84). Brit. administrator, nephew of John Hookham Frere; gov. of Bombay (1882-7); as special commissioner to East Africa influential in abolishing slave trade in Zanzibar; as gov. of Cape Colony (1877-80) attempted confederation of South Africa.

Fresco. Painting on fresh plaster, 6-36; from Pompeii, 6-415 illus.

Fresh-water fisheries, methods used and haul series, 3-380.

Fresnel (frânel), Augustin Jean (1788-1827). Fr. physicist; research on wave theory of light; improvements in lamps and reflectors, 4-502, 2-56.

Freud (froid), Sigmund (1856-1939). Austrian neurologist and psychologist, 3-469; on memory, 2-42, 5-168; Jung and, 4-386; influence on modern novel, 5-473; and medicine, 5-165; portrait, 6-300 illus.

Frey. In Norse myth., god of peace, prosperity and fruitfulness.

Freyja. See Freya.

Freyberg, Bernard Cyril Freyberg, Baron (b. 1898). New Zealand soldier; won V.C. in 1st World War; c-in-c. N. Zealand expeditionary force, 1939-45; superintended the evacuation of Crete, 1941; wounded nine times; gov.-gen. of New Zealand 1946-52. Made a baron in 1951.

Freyja (frî'ä), Freya, or Freya. In Norse myth., goddess of love.

Freytag (frî'tahg), Gustav (1816-95). Ger. novelist and playwright; chief works, *The Journalists* and *Debit and Credit*; 4-14.

Frills. Members of one of the mendicant (begging) orders of the R.C. Church; 5-215, 214 illus.

Fribourg. Town and canton of Switzerland; suspension bridge, 2-67.

Friktion, 3-470, 5-158; anti-frictional alloys, 1-116; and energy, 3-245; in starting fire, 3-356; avoided by use of pulley, 6-303.

Friday, 6th day of week; origin of name, 3-55.

Friday, Man. Character in *Robinson Crusoe*, 3-4, 3 illus.

Friedhof Nansen Land. Formerly Franz Josef Land; Arctic archipelago of about 100 small isls. N. of Novaya Zemlia and E. of Spitzbergen, 1-220.

Friedrichshafen. Tn. of S. Ger., in Land of Baden-Württemberg, on N.E. shore of Lake Constance. Industries include engineering, tanning, boat-building; pop. 13,300.

Friendly Islands. See Tonga Islands.

Friendly Societies. Organizations formed for various benevolent objects, such as financial help and medical attention for the sick, death benefit, and old age relief.

Friends Society, and Ker Quakers.

Friese-Greene, William (1855-1921). Brit. inventor, in 1889 he took out the first patent for a cine camera and projector, 2-389.

Friesian, breed of dairy cattle; milk yield, 2-274, 275 illus.

Frisian (frî'zhân), or Frisian Islands. Chain in North Sea off Dutch coast; from former Zuider Zee F. and N. as far as Sleevik; 400 sq. m.

Friesland (frî'z-land). N.W. prov. of Netherlands, surface partly below sea-level, protected by dykes; 1,324 sq. m.; pop. 463,440; dairy farming and stock breeding.

Frieze. See Architectural Terms.

Frigate. Type of warship. Originally a fast sailing vessel introduced in 15th cent., developed from 15th cent. Venetian galley, 5-354; in modern Royal Navy, a fast, anti-submarine vessel; H.M.S. *Venus*, 5-356 illus.

Frigate bird, 3-471.

Frigg. In Norse myth., wife of Odin or Woden, father of the gods; mother of Balder, 1-349; Friday named after, 3-55.

Friilled lizard. Native of tropical Australia; 4-529, 328 illus. f.

Fringillidae. The finch family of birds.

Frinton-on-Sea. Coast resort in Essex; pop. 2,190; 3-298.

Frisius, Regnier Gemma (1508-55). Dutch astronomer, 2-383.

Frith, William Powell (1819-1909). Brit. artist; he excelled in painting canvases containing many figures, notable examples being "Derby Day" and "The Railway Station," 3-263 illus., 264.

Fritillaria. Member of lily family, bearing pendent chequered purple and white flowers; very beautiful in spring; popularly known as snake's head.

Fritillary. Name of a number of butterflies of the order *Appenidae*; usually bright yellow-brown in colour; black markings on upper surface, silvery underneath.

Friuli-Venezia Giulia. Region of Italy, formed 1947 from the provinces of Udine and Gorizia. Area 2,950 sq. m.; pop. 902,353.

Frobisher, Sir Martin (c.1535-94). Eng. sailor; made three important voyages in search of the north-west passage, 3-471, 1-131, 6-212.

Frobisher Bay. Inlet of Davis Strait opening westward at S. end of Baffin Land.

Fröbel, Friedrich Wilhelm (1782-1852). German teacher; inventor of the "kindergarten," 3-471, 3-166.

Frog, 3-472, 1-157 illus.; in biological classification, 1-151, 152; egg, 3-171 illus.; embryos, 3-240 illus.; eye, 3-353 illus.; foot, 3-413 illus.; hibernation, 4-173; tongue of, 7-291; killed by ultrasonic sound, 7-311.

"Frog," indentation on under side of a brick, 2-60.

Frogbit. Aquatic floating plant. Long-stalked, kidney-shaped leaves, 14 in. in diameter. Flowers white and yellow. Long roots penetrate the soil of ditch-bottom or river, 7-429.

Frog-hopper. Insect, 4-269 illus.

Nymphs are covered with froth.

Frogman. Diver who wears self-contained suit for working in shallow water, 3-96, 95 illus.

Frogmore. Royal mausoleum 1 m. S.E. of Windsor Castle; Frogmore House, 7-460.

Froissart (frwah'sahr), Jean (c. 1338-1410). Fr. chronicler and poet, 3-477, 3-455, 454 illus.

From a Railway Carriage, verses by R. L. Stevenson, 7-156 f.

Frome (froom). Tn. in Somerset. King. Chief industries are brewing, printing, cloth mfr.; pop. 11,116; 7-85.

Frome, Lake. S. Australia, 7-102.

Fronde, The. A civil war in France during minority of Louis XIV (1649-52) and the consequent war with Spain (1653-59), so called (fronde, "sling") from windows having been pelted by Paris mob; its suppression contributed to the growth of absolutism under Louis; 5-151.

Frötenac, Count Louis de (1620-98). Gov. of New France (Canada); he was a French nobleman and served as a soldier with distinction; a successful governor, but haughty manner made him many enemies.

Frost, Robert Lee (b. 1875). Amer. poet, 7-366.

Frost, 3-477; protection of fruit trees, 3-480.

Froude (frô'd). James Anthony (1818-94). Brit. historian, often prejudiced but a master of Eng. style (*History of England from the Fall of Wolsey to the Death of Elizabeth*; *Reminiscences of Thomas Carlyle*; *Life of Beaconsfield*); 3-291.

Fruiteuse, a sugar; made by plants, 7-186, 6-182.

Fruit and Fruit Growing, 3-478; fruits, botanically defined, 3-180; canning, 2-212; produced by fertilized ovary, 3-396; insects necessary for ovary, 4-270; market gardening, 5-130. See also names of chief fruits.

Fruit-fly, 3-402.

Fruit spraying, methods, 3-179, 480 illus.

Fruit trees, origin in Caucasus, 1-269.

Frunze. Cap. of Kirghiz S.S.R., pop. 92,659; 4-413.

Fry, Charles Burgess (1872-1956). Brit. athlete and journalist; in 1893 led the Oxford University Association football, cricket and athletic teams; former holder of world's long jump record; captained England at cricket in 1912; played Association football for England.

Fry, Christopher (b. 1907). Brit. dramatist; notable for revival of verse drama. Plays include *The Phoenix Too Frequent* (1916); *The Lady Not for Burning* (1948); *Venus Observed* (1950); 3-122.

Fry, Elizabeth (1780-1845). Prison reformer, 3-480.

Fry, E. Maxwell (b. 1899). Brit. architect; with his wife, Jane Fry, and Le Corbusier designed buildings for Chandigarh, India, 4-174; 1-219.

Fry, Roger Elliot (1866-1931). Brit. painter and art critic; defender of Post-Impressionism which he helped to popularize in England, 6-210; wrote *Vision and Design* (1920).

Frying. In cookery, 2-498.

Fuad (foahad') I, Ahmed Ali Fasha (1868-1936). King of Egypt; became sultan (1917), proclaimed king (1922), upon termination of Brt. protectorate, 3-178.

Fuchs, Klaus Emil Julius (b. 1911). Ger. physicist and betrayer of Brit. atomic secrets, 1-305.

Fuchsia. Flowering plants, 3-485. sepals, 3-400.

Fucus. Genus of brown seaweeds, including bladder-wrack and saw edged wrack.

Fuehrer (Ger. leader). Title assumed by Hitler, in 1934, when he combined offices of president and chancellor of Ger., 7-485.

Fuel. Any substance burned to produce heat, 3-486; natural gas, 5-331; peat, 6-103.

Fuenterabía (fwenterrahb'ä), Spain. Tn. on Fr. frontier, on r. Bidassoa; famous fortress destroyed by French (1794); Wellington crossed Bidassoa in spite of opposition (1813).

Fugger (foog'ger). Wealthy family of Ger. merchants and bankers famous in 16th cent.; founded by Johann Fugger, a Bavarian weaver, in the 14th cent. Maintained correspondence in all parts of Europe, and their letters, preserved in Vienna state library (published 1923), give a detailed picture of the years 1568-1605.

Fujiyama (foofiyah'mä), or Fuji-san. Sacred mt. of Japan, 70 m. S.W. of Tokyo; 12,395 ft., 4-311, 346 illus.

FUKIEN

Fukien [fō'kien], China. Maritime prov. in S.E.; 61,000 sq. m.; pop. 11,990,000; cap. Foochow.

Fula. Dominant African people in the w. Sudan, est. number 8,000,000; light in colour, well-marked features; probably of Berber origin.

Fulbert, Canon (uncle of Héloïse), and Abelard, 1-3.

Fulcrum. Fixed edge, point, or pivot on which the bar of a lever rests and in movement rotates.

Fulda [fool'da], Ludwig (1862-1939). Ger. dramatist; wrote *The Talisman*, *The Last Paradise*.

Fulda, Ger. tn. in Hesse, famous in Middle Ages for Benedictine abbey; pop. 30,000; cattle market; rly. workshops.

Fulgurites. Tubes in sand or rock made by lightning passing through these materials and fusing them; common in Alps and Pyrenees.

Fulham. Met. bor. of s.w. London on S. side of the Thames; pop. 122,047; the Manor House became the palace of the bishops of London in 11th cent.; power station, 3-218 illus.

Fuller, Thomas (1808-61). Eng. clergyman and writer; style vigorous and full of humour; chaplain to Charles II (*History of the Worthies of England*).

Fuller's earth. A clay-like substance used in cleansing cloth and wool of grease, and in clarifying oil; greenish, brownish, or yellow; 2-406 7-236.

Full stop, in punctuation, 6-309.

Fulmar petrel. Seabird of the shearwater family, 7-20 with illus.

Fulminate. Chemical compound which will explode violently when struck or heated; in percussion-cap gun, 3-359; fulminating silver, 7-56.

Fulton, Robert (1765-1815). U.S. engineer; first man to apply steam to navigation, 3-488; one-man submarine, 7-171.

Fumaroles. Vapour outlets found in volcanic dists., which act as tunnels for the escape of gas; in Tuscany, 1-182.

Funchal. Cap. of Madeira pop. 95,765; picturesque tn. with narrow steep streets; sugar plantations and vineyards; 5-66 with illus.

Fundamental Theorem, in algebra, 1-106.

Fundamental Units. Arbitrarily chosen units of those physical quantities that are regarded as fundamental concepts, e.g. length, mass, and time. The chief systems of fundamental units are: centimetre, gram,

second (C.G.S.), metre, kilogram, second (M.K.S.), and foot, pound, second (F.P.S.). The first two are international, but the third is used only in English-speaking countries.

Fundy, Bay of. Large inlet of Atlantic between New Brunswick and Nova Scotia, remarkable for high tides.

Fünen or Fyen. Largest of Danish isls. after Zealand; 1,133 sq. m.; pop. 286,000; with adjacent isls. forms prov. of Fünen; cap. Odense; ferry service, 3-72.

Funkirchen (Luxury). See *Pécs*.

Fungi. Group of flowerless plants, some 37,000 species, 3-488, 5-336 illus.; combine with algae to form lichens, 4-490; lack of chlorophyll, 6-215; in fairy ring, 3-339, 338 illus.; moulds and mildews, 5-284; mushroom, 5-301; as a parasitic plant, 1-447; in plant life, 6-214; poisonous fungi, 6-236; rust fungus, 6-181; yeast, 7-512.

Fungicides, in fruit spraying, 3-480.

Funny-bone. Really not a bone, but the ulnar nerve, which is only slightly protected at the elbow; pressure or blow on this nerve causes sharp, tingling pain.

Fur-farming, animals bred, 3-496.

Furies. In Gk. and Rom. myth., goddesses who punished crime. In Gk. they were called the Erinyes, i.e. the avengers, or as a propitiation, the *Eumenides*, i.e. the kindly ones. Their names were Alecto, Megaera, Tisiphone.

Furlong. Brit. measure of length, one eighth of a mile or 220 yds. Name derived from the length of the old English plough furrow.

Furnace, 3-490; blast furnace, 1-182; in boilers, 1-501; principle of induction furnace, 4-171.

Furness. Dist. of N.W. Lancashire, peninsula separated by Morecambe Bay from rest of co.; hematite iron ore; ruins of famous abbey.

Furniss, Harry (1851-1925). Brit. caricaturist, illustrator, author, lecturer; for many years on staff of *Punch*.

Furniture, 3-490; beds, 1-102; mahogany, 5-87; maple wood, 5-117; latex foam upholstery, 6-167 illus.; wickerwork, 1-380; furniture-making as a career, 2-231.

Furniture beetle; small beetle, *Anobium punctatum*, whose larvae are the "wood-worm" of furniture; adult is about 1 in. in length, cylindrical, brown in colour; emerge in May making the "worm" holes, and fly to other furniture; larval life is 2 to 3 years; 2-12.

GADSDEN PURCHASE

Furnivall, Frederick James (1825-1910). Brit. philologist; founded Early English Text Society, Chaucer Society, and other societies for publication of texts; supervised publication of 43 facsimiles of quartos of Shakespeare's plays; conceived the idea of the *New (Oxford) English Dictionary*, though he did not become one of its editors.

Furs, 3-496; value of beaver skins, 1-401; skinning a fox, 2-202 illus.; types of fox fur, 3-426; in hat making, 4-137; mink, 5-221; mole-skin, 5-231; nylon "fur," 5-188 illus.; rabbit, 6-328; raccoon, 6-328; skunk, 7-61.

Fure, in heraldry, 4-164 illus f.

Furtwängler [foort'vengler], Wilhelm (1886-1951). Ger. conductor, director of Berlin state opera, 1920-23; conductor of many famous orchestras, including Vienna and Berlin Philharmonic, New York Philharmonic, 1925-27. A musician noted for deep and subtle interpretative powers.

Furze. See *Gorse*.

Fusan (Korea). See *Pusan*.

Fuse, in artillery, 1-260; of bomb, 1-511; radio proximity, 1-173 with diag.

Fuse. Safety device in electrical machines and wiring systems. Consists of a conductor made of a material designed to melt when an excessive current flows. It is placed at the beginning of the circuit, and when it melts stops the current flowing into the circuit; 3-213; bismuth used in, 1-475.

Fusee-and-spring. Clock mechanism; how it works, 2-417.

Fuselage. Body of an aeroplane, 1-39.

Fusel-oil. A poisonous liquid formed in fermentation; used in paints and varnishes.

Fust, Johann (d. 1406). Ger. money-lender, associated with Gutenberg in invention of printing; ran printing works with Peter Schoeffer.

Fustian. A cotton cloth, used in making hard-wearing clothes.

Fustic. Yellow dye, 3-141.

Futures. See *Stock Exchange Terms*.

Futurism. Art movement launched in 1910 by It. writer F. T. Marinetti, 4-320.

Fyen (Denmark). See *Fünen*.

Fylde, The. Tract of flat fertile country around Blackpool, Lancs. North and South Fylde are parliamentary constituencies, 1-480.

Fylot. See *Swastika*.

Fyrd. Anglo-Saxon militia, 1-217.

G

OUR capital G is derived from the Latin C, which, as stated under C, is a rounded form of the Greek Gamma. Until the middle of the 3rd century B.C. the letter C was used in Latin inscriptions to denote both the c and q sounds, and throughout the whole of Roman history C remained as the symbol for G in the abbreviations C. and Cn. for "Gaius" and "Gnaeus." But because of the inconvenience of this practice, a slight modification

was made for the g sound. Plutarch says that the symbol was invented by Spurius Carvilius Ruga, who spelled his family name RVGA instead of RVCA (the V still being used for the sound which we represent by U). The first the only change was that the lower lip of the crescent rose in a straight line. In a later form this was curved inward, and in another had a sort of "beard" added, which became the little cross-bar of to-day's G.

Gabelle. Fr. salt tax: one of the causes of the Fr. Revolution, 6-491.

Gaberdine. Commercial term for fine fabrics in cotton or wool of close twill weave. Formerly a long loose outer garment of rough dark material worn in Middle Ages by pilgrims and beggars. Associated particularly with Jews as the *caftan*.

Gable. In architecture, the triangular portion of the end of a building, bounded by the sides of the roof and a line joining the eaves.

Gabon. Territory of Fr. Equatorial Africa; cap. Libreville, 2-482, 483.

Gaboon mahogany. Timber resembling

mahogany, produced in W. Africa, 5-87.

Gaboriau [gabaw'io], Émile (1833-73). Fr. writer of detective stories (*Monsieur Lecoq*, *The Slaves of Paris*, *Other People's Money*).

Gabriel [gä'bríel]. Archangel and heavenly messenger sent to the Virgin Mary (Luke 1, 19, 26), the prophet Daniel and others; recognized by Mahomedans as well as Christians and Jews; in *Paradise Lost*, 5-211.

Gabun. See *Gaboon*.

Gad. Son of Jacob; ancestor of tribe of Gad.

Gad'dl. Family of Florentine artists. Most important was Taddeo (c. 1300-66), said to have continued Giotto's work on Florence campanile and to have built the Ponte Vecchio.

Gad-fly. Blood-sucking two-winged insect. Of 1,500 species, 36 are native to Gt. Brit. The females attack cattle and horses. Males are harmless.

Gadolinium (Gd). Chem. element; atomic no. 64; atomic weight 156.9; 3-224.

Gadsden Purchase. Territory s. of Gila r. in Ariz. and N.M., U.S.A. bought from Mexico in 1853; sale negotiated

GAEA

by James Gadsden, U.S. minister to Mexico.

Gaea, In Gk. myth., the earth goddess, 7-370; and Daphne, 3-49.

Gaelic League. Organization founded in Dublin in 1893, devoted to preservation and revival of Irish as a literary language; and Irish Literary Revival, 4-287.

Gaelic and Gaelic, 3-497; in Inverness-shire, Scot., 4-275.

Gaeta [g'ta]. It. Strongly fortified spt., 45 m. n.w. of Naples; refuge of Pope Pius IX when he fled (1848-50) from Rome; Francis II of Naples surrendered to Garibaldi there (1861) after siege.

Gaff. Steel hook used in landing fish, 5-384.

Gallard Cut. Panama canal, 6-55 illus.

Gainsborough, Thomas (1727-88). Eng. painter, 3-487, 3-280; and Van Dyck, 7-380; The Blue Boy, 3-267 illus.; William Pitt, 6-208 illus.

Gairloch. Sea loch of Scot., on w. coast of Ross and Cromarty, 6-455.

Gaitskell, Hugh Todd Naylor (b. 1906). Brit. Labour politician, min. of fuel and power in 1947; min. of finance for econ. affairs, 1950; chancellor of exchequer, 1950-51; leader of Labour party, 1955.

Galeata nebulae, 5-360.

Galah Rose-breasted cockatoo, 2-437.

Galahad, Sir. Knight of the Round Table, son of Lancelot and Elaine; through valour and purity was granted vision of the Holy Grail, 1-250, 4-51, 6-457.

Galapagos Islands. Island group in Pacific Ocean, 700 m. w. of Ecuador, area 2,868 sq. m.; pop. about 1,000; 3-498, 3-161; iguanas, 4-235.

Galashiels. Tn. in Selkirkshire, Scot.; pop. 12,496; centre of Scot. woollen industry; 6-531.

Galata Bridge, spans the Golden Horn, at Istanbul, 7-334 illus.

Galatea [galat'ea]. Statue made by sculptor Pygmalion and endowed with life by Venus; also, nymph in classical legends.

Galatia [galat'ia]. Anc. country in cent. Asia Minor; kingdom founded by Celts.

Galatians. Epistle to the. Ninth book of the New Testament, written by the Apostle Paul to the Galatian churches about A.D. 56.

Galatz. Rumanian port at head of Danube delta, 6-170.

Gala Water, in Scot., rises in Lammernuir Hills and flows s.w. to r. Tweed. Length about 18 m., 5-40.

Galaxy. Originally, the name of the Milky Way (q.v.); now applied to the whole of the wheel-shaped system of stars (the galactic system) in which the sun is situated. Also the name of any one of the millions of similar systems scattered throughout space, 1-281 illus. *See also* Nebula.

Galdhøppigen. Highest mt. in Norway (8,398 ft.), 5-462.

Galen (Claudius Galenus d. v.p. 200). Greco-Roman physician, 3-498; and medieval surgery, 7-191, 1-143, 5-161, 1-492.

Galea (lead sulphide), chief source of lead, 4-403.

Galerius (Galerius Valerius Maximianus, d. 311). Rom. emperor A.D. 305-311; rose from common soldier to be Diocletian's son-in-law and successor; and Christians, 2-379.

Gallia [galish'ia]. Poland. Agricultural dist. on n. slopes of Carpathians, former Austrian crownland; has oil deposits; part incorporated in U.S.S.R. in 1945.

Gallia. Dist. in N.W. corner of Sp., formerly kingdom; inhabitants, Gallegos, resemble Portuguese; chief city, Corunna.

Galilee (Hebrew "border" or "ring"). Rom. prov. in N. Palestine, land of Christ's boyhood and chief centre of His active work.

Galilee. Sea of, Palestine, 6-18, 46 illus.

Galileo (Galileo Galilei, 1564-1642). It. scientist and astronomer, 3-498, 5-162, 4-330; and air pressure, 1-370; experiments with falling bodies, 4-68; pendulum, 6-111; and telescope, 1-280, 281, 7-218; made the first thermometer, 7-367.

Gall or Gallus, St. (c. 550-645). Irish monk and missionary to European continent; founded monastery of St. Gall, Switzerland.

Gall, Franz Joseph (1758-1828). Ger. anatomist, founder of the pseudoscience of phrenology.

Galland, Antoine (1616-1715). Fr. orientalist; *Arabian Nights* collection, 1-196.

Gallas. African people; in Abyssinia, 1-6.

Gall bladder, bile and, 4-521, 4-27.

Gallean. Span. sailing ship of 13th cent. Used for war and commerce. Largest displaced 950 tons and had four gun decks. Slow and awkward to handle, they formed the bulk of the Spanish Armada, 1588; 1-210.

Galley. Oared war-ship of the Mediterranean Sea; towed by slaves. difference between types of s and s Europe, 7-28; at battle of Lepanto, 1571, 5-353.

Galley proofs, in printing books, 2-1.

Gall-fly. Small "wasp-like" insect, 4-261, 262 illus., 3-172; grub, and gall, 4-268 illus.; and oak apples, 5-489; reproduction, 4-269.

Galli-Curiel [gallickoor'che]. Amelita (Mrs. Homer Samuels) (b. 1889) Ital.-Amer. coloratura soprano; famous roles were Dinorah, Lucia, Juliette, Gilda in *Rigoletto*.

Gallieni [galya'ne]. Joseph Simon (1819-1916). Fr. general and colonial administrator, pacifier of Madagascar (1896-1905), military gov. of Paris (1914-15).

Gallio, Lucius Junius Annaeus (1st cent. A.D.). Older brother of Seneca, Rom. proconsul of Achaia (A.D. 53), who "cared for none of these things," when Jews baled the Apostle Paul before him; "careless Gallio" has become a synonym for easy-going indifference.

Gallipoli. Peninsula of Europe, part of w. Turkey. Length 52 m., width 2-12 m. In 1st World War, 3-49, 7-180, 479 illus.

Gallium (Ga). Chem. element; atomic no. 31; atomic weight 69.72; 3-224; discovery, 3-225.

Gallon. A unit of measure of liquid volume. *See* Weights and Measures.

Galloway. Former division of s.w. Scot., comprising counties of Kirkcubright and Wigton, famous for breeds of horses and cattle; the Bruce were lords of Galloway.

Galloway, Mull of, Scot. A bold headland of Wigtonshire, the most southerly point in Scot.; has light-house visible for 23 m.

Galloway cattle, beef breed, 2-271.

Gallup Poll. Sample opinions taken from a representative cross-section of the public in an attempt to foretell accurately the opinion of the whole, named after Dr G. Gallup, its American originator.

Gall wasp. *See* Gall-fly.

Galsworthy, John (1867-1933) Brit. novelist and playwright, 3-499, 5-473, 3-291.

Galt, John (1779-1839). Scottish novelist, whose sketches of Scottish life (*The Lyrshire Legates*; *The Annals of the Parish*; *Just of the Land*) have given him a secure place in history of the novel; 6-514.

Galties Mts. Ireland, extending 15 m. E.-W. through Tipperary and Limerick. Highest peak, Galtymore; 4-281.

Galtton, Sir Francis (1822-1911). Brit. anthropologist and meteorologist, noted student of heredity; made first attempt to chart weather on extensive scale and propounded anticyclone theory; and fingerprints, 3-333.

GANGES

Galvani, Luigi (1737-98). It. scientist, 3-500; and electrical theory, 3-210.

Galvanised iron. Iron sheets coated with zinc, 7-523.

Galvanism. The electrical treatment of medical disorders by the use of direct current.

Galvanometer. Instrument for detecting small electric currents; aid to mining, 5-216. When calibrated in amperes or fractions thereof it is an ammeter, and is used for measuring the strength of currents, 3-46 with illus.

Galveston. Tn. and port of Texas, U.S.A.; pop. 65,898; 7-260.

Galvez, Manuel (b. 1882). Argentinian writer, 7-101.

Galway. Co. of Irish Rep., in prov. of Connacht; area 2,293 sq. m.; pop. 160,124; co. tn. Galway. In the w. is the beautiful dist. of Connemara. Lough Corrib is the chief lake. Industries incl. cattle rearing, agriculture, fishing, linen and woollen mfrs.

Galway Bay, Irish Repub. Inlet of the Atlantic on the w. coast between Galway and Clare, 30 m. long average breadth 10 m.

Gam, David. Esquire to Henry V at Agincourt, 1-68.

Gama, Vasco da. *See* Vasco da Gama.

Gamaelief [gamaliel] (d. c. 52). A learned Pharisee. Paul's instructor in law (Acts xxi, 3), advocate in the Sanhedrin of moderate treatment of the Christian apostles (Acts v, 34-9).

Gambetta, Léon (1838-82). Fr. statesman and orator, anti-imperialist during Second Empire and Republic, an leader during and after Franco-Prussian War; premier in 1881, 3-159.

Gambia. River flowing N.W. over 1,000 m. through Ft. Senegal and Brit. Gambia into Atlantic at Bathurst; navigable for about 350 m.

Gambia. Brit. colony and protectorate in W. Africa, on both sides of the r. Gambia. Area 4,600 sq. m. pop. 279,700. Bathurst is cap. 7-440.

Gamboge, a resin, uses, 6-389.

Game and Play of Chess, The. Book printed by William Caxton, 2 illus.

Game fish, types of, 3-384; methods of angling, 3-385; compared with coarse fish, 6-103.

Gamelin [gamlan], Marie Gustave (b. 1872). Supreme commander of French forces Jan. 1938-May 1910 superseded by Weygand; imprisoned Vichy govt.; freed by Allies.

Gametes, reproductive cells, chromosomes and genes in, 4-166.

Gamma, γ, Γ (Rom. G. Γ) Third letter of Gk. alphabet.

Gamma rays. Electromagnetic rays emitted by many radioactive substances; radio-activity, 1-297, 6-311, 6-339; ionizing effects of, 4-277; wavelength, 3-221.

Gammer Gurton's Needle (c. 1560). Early Eng. comedy, 3-284.

Gand (Fr. name). *See* Ghent.

Gander, r. of Newfoundland, 5-394.

Gandhara school, in Indian art works, 4-219 with illus.

Gandhi, Mohandas Karamchand (1869-1918). Indian leader and patriot, 3-500; and the Congress party, 4-254, and partition, 6-40.

Gandia, Giovanni Borgia, Duke of Sic Borgia, G.

Ganesa [gan'dsa] or Ganesa (Sanskrit, "lord of the host"). Hindu god of wisdom and remover of obstacles; chief of the minor deities who attend Shiva; represented as a human figure with the head of an elephant.

Ganges. Chief r. of the Indian sub-continent. Rises in Himalayas and flows by a wide and intricate delta into the Bay of Bengal, 3-501, 6-44, at Benares, 1-427; density and characteristic of pop. in valley, 4-240, 241, 1-268; rice, pop. 6-397

GANGRENE

Gangrene. Death of a mass of tissue; in wounds, 1-176.
Gangsters. In Chicago, 2-335.
Gannet, seabird. 3-502 with illus.
Gantry. Type of crane, 2-525.
Ganyমেদে (gan'méde), in Gk. myth., beautiful youth carried off to be cup-bearer of Zeus.
Gao-Gao. In. on riv. Niger, in Fr. W. Africa; pop. 10,000, 6-486.
Gaping Ghyll. Pothole in Yorks, with sheer drop of 354 ft., 4-511, 2-281.
Garamond. Old type face revived by Monotype Corporation, 5-248.
Garay, Juan de (c. 1527-1583). Span. explorer and conquistador; Buénos Aires settlement, 2-108.
Garbutt, Cyril Forster (1875-1955). Brit. prelate; bishop of Winchester, 1932-42, in 1942 became Archbishop of York; G.C.V.O. 1955; wrote *Physician Heal Thyself*.
Garbo, Greta. Stage name of Greta Gustafsson (b. 1906), Swedish-born American film actress. First film *The Arsenic and Old Lace* (1928). Later films include *Queen Christina*, *Anna Karenina*, *Camille*, *Maria Walewska*, *Ninotchka*.
Garcia (gahr'gá), Manuel (1851-1906). Famous singing teacher; Jenny Lind was one of his pupils; invented the laryngoscope.
Garda Lake, Italy; largest and most easterly of the Italian lakes; area 180 sq. m.; tourist centre, 4-304, 312 illus.
Garde Mobile. Fr. police force organised on military lines to maintain order during civil disturbances, 6-253.
Gardenia (gahr'dé-níá). Genus of trees and shrubs of madder family (*Rubiaceae*), natives of tropical and sub-tropical regions.
Garden of Eden, traditional location, 5-176; Adam and Eve in, 1-15.
Garden of England, The. Name given to the co. of Kent because of its fertility, 4-398.
Garden pea. Vegetable, 6-99.
Gardens and Gardening, 3-503; Jap. miniature gardens, 4-353; knot-garden, 3-504 illus. 1; market gardening, 5-129; transplanting 6-216.
Garden snail, 5-232 illus. f.
Garden Warbler. Bird; 7-418, 419 illus.; migration, 5-204 illus. f.
Gardinas. See Grodno.
Gardiner, Alfred George (1865-1940). Brit. journalist and author; edited *Daily News* from 1902 to 1919.
Gardiner, Stephen (c. 1493-1555). Eng. prelate and statesman; succeeded Wolsey as Bishop of Winchester; he was largely responsible for fall of Thomas Cromwell and inherited his power; lord chancellor 1553-5.
Garefolw. See Great Auk.
Gare Loch, Scot.; See loch, arm of the Clyde, 2-135.
Gareth and Lynette. Arthurian legend, 6-457.
Garfield, James Abram (1831-81), 20th pres. of U.S.A.; general in the Federal army, American Civil War; shot by disappointed office-seeker.
Gar-fish. Tropical fish, 5-6 ft. long. Elongated sword-like beak with rough edge, and widely-set teeth.
Gargano, Mount. Mountainous peninsula of S. Italy, extending about 30 m. into Adriatic, 4-304.
Gargantua (gahr-gan'túá). Giant hero of Rabelais' satire of that name, whose "Gargantuan" appetite is proverbial; 4-17.
Gargoyle. In architecture, a quaintly formed head of an animal, man, or devil; used as a decorative spout for the rain-water from a roof.
Garibaldi, Giuseppe (1807-82). Italian patriot and hero, 3-504, 4-316; and Stelly 7-50.
Garlic. A bulbous plant of the onion family; of strong odour, it is largely eaten in S. European countries and is also used medicinally; 5-512.
Garmisch-Partenkirchen. Twin towns in Upper Bavaria at foot of the Zugspitze. Winter sports centre pop. about 10,000; 1-388 illus. f.

GAWAIN

Garneau, Francis Xavier (1809-66). French-Canadian historian, 2-204.
Garnerin, André Jacques (1770-1825). Fr. balloonist, parachuted from balloon (1797), 6-72.
Garnet. Semi-precious stone. Finest specimens come from Germany and Czechoslovakia, 7-164; crystal, 3-4 illus.
Garnett, David (b. 1892) Brit. author and publisher, grandson of Richard Garnett; works include *Lady in the Fox* (Hawthornden and Tait-Black prizes for 1923), *A Man in the Zoo*, *Pocahontas*. His mother was Constance Garnett (1861-1946), famous translator from Rus.
Garnett, Richard (1835-1906). Brit. librarian and author, keeper of the printed books in Brit. Museum; wrote lives of Carlyle, Emerson, Milton; with Gosse wrote history of Eng. literature.
Garonne, r. of Spain and Fr., 378 m. long. Rises in Sp. in Pyrenees, nr. Mt. Maladetta, flows n.w. to Bordeaux where it joins the Dordogne. Estuary of two rivers called the Gironde, 6-314.
Garriek, David (1717-79). Brit. actor and manager, introduced more natural style of acting; inaugurated revival of Shakespeare's plays in their original form; universally considered greatest Eng. actor of his age, equally at home in tragedy of farce; and Lichfield, 4-491; epitaph on Goldsmith, 4-43.
Garry, Loch. Fresh-water loch, Inverness-shire, Scot., 4-275.
Garter, Order of the. Premier Brit. order of knighthood, 5-530, 3-520, 4-418.
Garter King-of-Arms, 4-165.
Garvin, James Louis (1868-1947). Brit. journalist and publicist, ardent imperialist, most powerful champion of Joseph Chamberlain's tariff reforms; editor of the *Observer* (1908-42); wrote *Life of Joseph Chamberlain*, O.H. 1941.
Gary, Indiana, U.S.A. World's greatest steel-producing centre; at head of L. Michigan, about 25 m. from Chicago; pop. 132,490; 4-255.
Gas. For lighting and heating, 3-505, 3-487; cookery, 2-490; gas refrigerator, 6-370; heat and molecular motion, 4-146; lighting by, 5-290; pipes of asbestos cement, 1-263; natural, 5-339.
Gas-black, in printing inks, 4-262.
Gas constant. In physics, 3-510.
Gas discharge lamp, types of, 3-220.
Gascony. Former W. coast prov. of Fr. Ceased to be a prov. 1790.
Gas engine, 3-507.
Gas engineering, as a career, 2-230.
Gaseous diffusion method of separating isotopes, 4-301.
Gases, 3-508; and aerosols, 2-455; Boyle's Law, 2-32; expansion of, 6-185; gases in air, 1-79; hydrogen, 4-221; molecules in, 4-520; poison gas and gas-masks, 2-305; solidification at low temperatures, 3-465; from volcanoes, 7-404.
Gaskell, Elizabeth Cleghorn (1810-65). Brit. writer, 3-500, 5-472.
Gasket. A tapered line on a yard or sail for use in making the sails fast when they are furled.
Gas mantle, incandescent, 3-505.
Gas meters, how they work, 5-183 with illus.
Gasoline. Another name, used especially in U.S.A., for petrol.
Gasparri, Pietro (1852-1934). It. cardinal, sec. of state under Pope Benedict XV (1914-30).
Gaspé, Philippe Aubert de (1786-1871) French-Canadian novelist, 2-203.
Gaspereau. See Alewife.
Gasperi, Alcide de (1881-1954). It. statesman; imprisoned 1926-30 for anti-fascist activities; worked in "underground" movement during 2nd World War; prime min. 1945-53.
Gas poisons, types of, 6-236.
Gastric juices. Fluid secreted by the mucous membrane of the stomach, 4-27; in digestive process, 3-90; hydrochloric acid in, 4-215.
Gastropoda. A class of molluscs, 5-232.
Gas turbine, in aircraft, ships, and industry, 7-330.
Gas-turbine electric locomotive, 5-13 with illus.
Gatekeeper butterfly. See Small Meadow Brown.
Gate of Judgment. In the Alhambra, Granada; legend, 1-111 with illus.
Gates, Horatio (1728-1806). Amer. general, helped to bring about Burgoyne's surrender at Saratoga in 1777; was defeated at Camden in 1780.
Gateshead. Mfg. tn. in Durham; pop. 115,017; practically suburb of New-castle on r. Tyne; important ship-building, engineering, glass industries; also large rly. workshops, and extensive export trade; 3-139, 5-394.
Gates of the Rocky Mountains. Narrow gorge through which flows the Missouri r., 6-227.
Gath. Anc. Philistine city in Palestine, 6-157.
Gatineau river, Canada, flowing e. 400 m. into Ottawa, 6-10.
Gatling gun. Type of machine-gun, 5-64.
Gatun dam, Panama canal, 6-59.
Gatun Lake, Panama Canal. Artificial body of water created by damming the r. Chagres; area 102 sq. m.; 6-58.
Gatwick Airport, Surrey. Alternative to London Airport, 1-86, 5-27.
Gauchos. Argentine cowboys, 1-223.
Gauden, John (1605-62). Eng. churchman and writer; reputed author of the celebrated *Eikon Basilike*, a defence of Charles I purporting to have been written by the king himself; Bishop of Exeter and of Worcester.
Gauge, of railway track, 6-356.
Gauge. Measuring device; in motor industry 6-233.
Gauguin, Paul (1848-1903). Fr. painter, in 1881, gave up business, left his wife and children, and devoted himself to painting. Lived for a while with Van Gogh at Arles, 7-381; in 1891 went to Tahiti and there lived as a native. His art is characterised by brilliant colour, simplified form. Later works include many Tahitian studies; 3-449.
Gaul. Old name for Fr., derived from Gallia, name given by Romans to that country. N. Italy was Cisalpine Gaul, 3-433.
Gaulle, Charles André Joseph Marie de (b. 1890). Fr. soldier and politician, 3-511, 7-489.
Gauls. Celtic people; invasions in Italy, 6-430; and Caesar's expedition to Brit., 2-275.
Gauss (gawz), Karl Friedrich (1777-1855). Ger. mathematician and physicist; founded mathematical theory of electricity.
Gauss. The O.G.S. electromagnetic unit of flux density or magnetic induction. It is equal to one maxwell per square centimetre.
Gautama. See Buddha.
Gautier (gō'tyā), Théophile (1811-72). Fr. poet, novelist, and critic, originator of the theory of "art for art's sake" in Fr.; *Émaux et Camées*, his masterpiece, a collection of poems exhibiting his love of miniature effects; novel *Mlle. de Maupin*, an attempt at self-analysis.
Gavelkind. Form of land tenure in Kent and elsewhere in Eng., abolished 1296. In cases of intestacy land held in gavelkind passed to all the sons equally. The widow's dower was one-half.
Gaveston, Piers (d. 1312), Earl of Cornwall, arrogant, extravagant favourite of Edward II of Eng.; beheaded by Eng. barons.
Gavotte (gavot'). Originally a Fr. peasant dance, merry and light; after its introduction at court in 18th cent. became quieter and more dignified; very popular as a theatrical dance.
Gawain, Sir, in Arthurian legend, nephew of King Arthur and knight

of the Round Table; and the Green Knight, 1-266, 6-451.

Gay, John (1686-1732). Eng. poet and dramatist; his *Beggar's Opera*, a famous social satire, created a furore in its day, and since successfully revived, 5-515.

Gaya. Tn. in Bihar state, India; rly. junction; pop. 105,223; 1-445.

Gay-Lussac (gajlusoak), Joseph Louis (1778-1850). Fr. chemist and physicist, discoverer of important law that volumes of combining gases bear simple and constant ratio to each other; pioneer in scientific observations from balloons, 1-354.

Gaza, Palestine. Anc. tn. 50 m. s.w. of Jerusalem; one of the important Philistine cities. Taken by Alex., and the Great, became rival of Alexandria and Athens as centre of Hellenic culture; modern port and commercial centre; pop. (1943) 30,300; 6-157.

Gazelle. Animal related to the antelope, 1-171, 1-69 illus. f.

Gaziantep, Turkey. Tn. and trading centre with pop. of 50,000.

Gdansk. See **Danzig**.

Gdynia. Spt. on Baltic coast of Poland, 6-240 illus.

Gean, or **mazzard**. Type of wild cherry tree common in Ot. Brit., 2-327.

Gears, in motor vehicle, 5-278, surface-hardening process of, 4-171.

Gebel Aulia dam. On the White Nile 25 m. above Khartum, completed 1937, 3-172.

Geber (Jabir ibn Haijan), Arabian chemist (8th cent.), work on inorganic acids, 1-12.

Gecko. Type of lizard, 4-529; foot, 3-413 illus.

Ged, William (1690-1749). Scottish goldsmith and printer, inventor of stereotyping.

Geddes, Sir Eric Campbell (1875-1937). Brit. businessman and politician. Remembered chiefly for the "Geddes axe", when as chairman of a committee to advise on nat. expenditure, 1921-23, he recommended drastic economies in govt. depts.

Geelong. Port of Victoria, Australia, 45 m. by rly. s.w. of Melbourne. Industries include textiles, cement, salt, rope, glass, tanning and engineering; famous school. Pop. 47,900.

Geffrye Museum, London; furniture collection, 5-300.

Gehenna. A ravine near Jerusalem used in anc. times for human sacrifice. Later name came to mean Hell, 4-361.

Geiger Counter. Instrument for detecting, and indicating the strength of, radiation by counting the number of charged particles entering it by virtue of the ionisation they produce. Invented by Hans Geiger (b. 1882) to detect atomic particles and used as a danger indicator when handling radio-active materials; ions and, 4-277.

Geikie, Sir Archibald (1835-1924). Celebrated British geologist; pres. of Royal Society 1908; for several years director-gen. of the geological survey of the U.K.; wrote several works on geology.

Geisha (gay'shah). Girl in Japan trained as professional entertainer. Taught music, dancing, singing and the art of conversation from an early age. Geishas are engaged to entertain at dinners or receptions.

Geisler tube. Form of evacuated tube for showing the luminous effects of discharging an electric current through various gases placed in it.

Gel [jel]. Semi-solid colloidal substance, 2-455.

Gelada baboon. African monkey, 5-240 illus. f.

Gelatine, 3-511; from seaweed, 1-105, in isinglass, 4-301; as a gel, 2-455.

Gelignite. Blasting explosive. Contains about 60 p.c. nitroglycerine, 4 p.c. nitrocellulose, 9 p.c. woodmeal, 27 p.c. potassium nitrate. Cheaper and less violent than blasting gelatine.

Gellimer. King of the Vandals, captured by Belisarius, in 533, 7-379.

Gellie, Claude. See **Claude Lorrain**.

Gellert. In Welsh legend the faithful hound of the prince Llewellyn slain by its master when he thought it had killed his infant son. The child was missing and the dog was covered in blood, but it was the blood of a wolf Gellert had fought in order to save the child. Traditional date of the event is 1205 and the place Beddgelert; but the story occurs all over Europe and comes from the East.

Gellius, Aulus (2nd cent. A.D.). Rom. writer of a miscellany, *Attic Nights*.

Geisenkirchen (gel'zenkikhén). Industrial tn. in Land of North Rhine-Westphalia, W. Germany, 8 m. N.W. of Essen, pop. 315,480; 6-468.

Gemara, The. Part of the Talmud written in Aramaic, containing a commentary on Jewish law, 4-151.

Gemini (the Twins), a constellation in the zodiac named after Castor and Pollux, 2-261, 2-490 illus., 7-524 illus.

Gemma'lon. Reproduction of a cell by growth of a bud which develops into a new cell.

Gemstones, 7-164; cameos, 2-189; polished by diamond dust, 3-84. See also **Stones**, **Precious**.

Gendarmerie. Armed police force in France and elsewhere, 6-253.

Generalife, The. Palace in Granada Spain, 4-60.

General Post Office (G.P.O.). Set up in 1710 for Brit. and Brit. territories abroad, 6-270; 4-52.

General Staff. An organized body of officers which assists commander-in-chief or chief executive in controlling military forces.

Generator. Machine such as an alternator or dynamo used for converting mechanical energy into electrical energy.

Genes. The controlling agents of heredity, 4-166.

Genesis [jen'esls] (Gk. "coming into being"). The first book of the Bible, sometimes called Book of Creation; it tells of the creation of the world, of the foundation of the Israelite nation, and of the nation's history down to deaths of Jacob and Joseph in Egypt; story of the creation, 1-15; 1-335; 1-411.

Genetics, 3-511, 4-168; benefits from study of, 1-450.

Geneva. City of Switzerland, cap. of Geneva canton, at s.w. extremity of Lake Geneva; pop. 115,000; 3-511; League of Nations building, 4-461 illus., 7-211; Calvin and, 2-178.

Geneva Convention. International agreement (1864) to lessen the sufferings of those wounded in war, 6-370.

Geneva, Lake. Largest lake in Switz., in s.w. bordering on Fr., 223 sq. m.; and Rhône r., 6-395; geological formation, 4-138.

Geneva spirit. Name for Dutch gin; origin of name 7-136.

Geneviève (zhenev'ev) (c. 422-c. 512). Patron saint of Paris, said to have saved Paris from Attila's Huns by her prayers; caused church to be built over tomb of St. Denis.

Genghis Khan. S. Jenghiz Khan.

Genies, good or evil spirits of the East; characteristics, 3-338.

Ginissiat dam, on R. Rhône, Fr., 6-396.

Genlis [zhahn'les], Stéphanie, Comtesse de (1716-1830). Fr. author and educator, tutor to Philippe Egalité's children, including Louis Philippe; anticipated many modern methods of teaching; views on athletics, 2-336.

Genoa. City and spt. of N. Italy; pop. 680,000, 3-512.

Genoa, Gulf of. Large indentation of Mediterranean in N.W. Italy, with city of Genoa at its head; basad southern portion known as Ligurian Sea.

Genocide or **Race Murder**. Any attempt "to destroy, in whole or in part, a national, ethnical, racial, or religious group, as such", was declared a crime by the U.N., Dec. 10, 1948.

Genre [zhahn'r] painting. The depicting of scenes of everyday life; in Dutch art, 5-382.

Genserie or **Gaiserie** (c. 396-477). Vandal king; conquered the African possessions of the W. Roman Empire; established his capital at Carthage; plundered Rome; seized Sicily, Sardinia and Corsica, 7-379.

Gentian. Annual or perennial plant, native to temperate and alpine regions, 3-513.

Gentian violet. A mixture of methyl-violet and dextrin, used as a commercial dyo and as a powerful antiseptic in treatment of skin diseases.

Gentiles. Term often used in Bible, especially in New Testament, to designate non-Jews.

Genus. Term used in biological classification, 1-155, 2-21, 1-451.

Geodesic. Shortest distance between two points; in relativity, 6-381.

Geodesy. Branch of applied mathematics concerned with determining the exact size, shape and curvature of the earth, and the position of geographical points, etc., upon it.

Geodesic surveying. Surveying in which the curvature of the earth is taken into account.

Geoffrey of Monmouth (c. 1100-54). Eng. historian and chronicler; his *Historia Britonum* (c. 1139) was based on stories and legends, Arthurian legends, 1-256.

Geoffrey Plantagenet (1113-51). Count of Anjou, husband of Matilda, daughter of Henry I of England and father of Henry II; origin of Plantagenet name, 4-162.

Geoffroy-Saint-Hilaire, Etienne (1772-1844). Fr. naturalist, pre-Darwinian believer in mutability of species; founder of the science of teratology or study of monsters.

Geography. Science that describes the earth's surface, its natural products, its peoples and their economic activities, 3-513; latitude and longitude, 4-432; maps and map-making, 5-118; physiography, 6-186; Ptolemy's map of the world, 6-301. See also **Exploration**; **Climate**; **Oceans**; **Winds**, etc.

Geological Survey. Brit. govt. dept. which undertakes among other things the collection of information regarding the geological formation of the country, and the publication of geological maps and explanatory literature concerning them; it was established in 1832; headquarters and museum at S. Kensington, London, 5-300.

Geology. The science of the earth, its origin, evolution, materials and physical structure, 3-515; earth quakes, 3-152; fossils, 3-424; 10 Age, 4-228; igneous rocks, 6-424; age of rocks determined by atomic transmutation, 6-352; origins of lakes, 4-438; limestone, 4-509; metamorphic rocks, 6-424, 3-515; mining, 5-215; mountains and their influence on civilization, 6-187, 188 and study of primitive Man, 5-101 N. Amer., 5-451; Rocky Mts. 6-425; rocks, 6-424; sand, 6-495; sedimentary rocks, 6-424; soil 7-83; valleys, 7-375; volcanoes, 7-404; vinda, 7-457-458 with illus. 5-179, 5-218, 2-409, 3-16; geology as a career, 3-517, 2-336. See also **Earth**; **Physiography**.

Geometrical progression, 6-532.

Geometridae (moths). See under **Willow Beauty**.

Geometry. Branch of mathematics 3-517; Cartesian, 3-78; theorem of Pythagoras, 6-315 diag.

Geophysics. Collective name given to branch of physical science concerned with the earth and its atmosphere; notably meteorology, seismology, atmospheric electricity, terrestrial magnetism; and mining, 5-215; oil prospecting, 6-149.

Geophyte. A plant with an underground root or tuber.

Geordies. Popular nickname for the inhabitants of Newcastle-upon-Tyne and surrounding region, 5-394.

GEORGE

George, Saint. Patron saint of Eng., 2-520; in mumming plays, 3-115.
George. Kings of Gt. Brit.: See below.
George I (b. 1660; reigned 1714-27). King of Gt. Brit., 3-520.
George II (b. 1683; ruled 1727-60). King of Gt. Brit., 3-521; and the elder Pitt, 2-310.
George III (b. 1738; ruled 1760-1820). King of Gt. Brit., 3-521 with illus.; influence of *Boltingbroke*, 1-506; and *Buckingham Palace*, 2-104; and popularity of *Cheltenham*, 2-315; and *Gibbon*, 4-19; sea-bathing, 1-384.
George IV (b. 1762; reigned 1820-30). King of Gt. Brit., 3-521 with illus.; and *Brighton*, 2-70; rebuilding of *Buckingham Palace*, 2-104; foundation of *National Gallery*, 5-328; pearl buttons on underwear, 2-146; and *Sheridan*, 7-27.
George V (b. 1865; reigned 1910-36). King of Gt. Brit., 3-522 with illus.; at *Delhi Durbar*, 4-253 illus.; and *Queen Mary*, 5-141 statue, 6-523 illus.
George VI (b. 1895; reigned 1936-52). King of Gt. Brit., 3-522 with illus.; in *Australia*, 1-319; and his consort 3-236; with *Roosevelt*, 6-450 illus.
George I (1845-1913). King of Greece. A Danish prince, *Christian William*, and a brother of *Queen Alexandra*. Offered Gk. throne and began a 50 year reign in 1863. Assassinated in *Salonika*, and succeeded by his son *Constantine*.
George II (1890-1947). King of Greece, proclaimed Sept., 1922, following abdication of his father, *King Constantine*; deposed 1924; returned 1935; when war broke out between Italy and Greece, 1940, he commanded his army, later when Germany over-ran country he moved with his govt. to Cairo and London. On outbreak of civil war in late 1941 he apptd. Archbishop *Dumaskinos* as regent; king returned to Greece after plebiscite in 1947.
George (prince of Denmark) (1653-1708). Consort of *Queen Anne* of England, 1-159.
George, Henry (1839-97). Amer. author and political economist; named "single tax" and made it a social creed (*Progress and Poverty*); also wrote *The Condition of Labour*.
George, Stefan (1868-1933). Ger. writer and poet influenced by *Mallarmé*, *Baudelaire* and *Verlaine*; translated works by *Dante* and *Shakespeare*, 4-14.
George Cross. Brit. decoration, 5-530 awarded to *Malta*, 5-98, 99 illus.
George Kastrioti (Albanian leader). See *Scanderbeg*.
George Medal. Brit. decoration, 5-530
George of Poděbrady. King of Bohemia (reigned 1458-71), 1-501.

SIGNS AND SYMBOLS USED IN GEOMETRY

□	square
□'	square inches
□'	square feet
∠ or ∠	angle
∠	right angle
△	triangle
○	circle
||	parallel to
∴	therefore
∵	because
°	degrees
'	minutes
"	seconds
π (pi)	ratio of circumference of circle to diameter
	= 3.14159265

Georgetown. Spt. of the Federation of Malaya, on w. coast; cap. of Penang; pop. 121,300; 5-93.
Georgetown. Cap. of Brit. Guiana, S. Amer.; pop. 81,794; 4-102.
Georgette. A thin silk material with rough surface, having warp and weft threads tightly twisted.
Georgia. Rep. of U.S.S.R.; area 29,000 sq. m.; pop. 3,542,300; 3-524, 6-177.
Georgia. A s. Atlantic state of the U.S.A.; area 58,876 sq. m.; pop. 3,444,578; cap. *Atlanta*; 3-523.
Georgian architecture. 1-217, 218 illus.
Georgics. Poem by *Virgil*, on art of farming and the charms of country life, 7-402.
Geotropism. In plants, 6-216, 217 illus.
Geraint and Enid. Arthurian legend, 6-157.
Geraldine, Mt. Jasper Nat. Park, Alberta, Canada, 9,100 ft. high, 1-94 illus.
Geraldine the Fair. Lady *Elizabeth Fitzgerald*, celebrated in some of the Earl of *Surrey's* sonnets; in late romantic legend, object of *Surrey's* fantastic chivalrous devotion.
Geraldton. Tn., W. Australia, on *Champion Bay*, 305 m. n.w. of *Perth*; has an extensive harbour, exports gold, copper, lead and wool; pop. 6,400.
Geranium. Flowering plant, 3-524; cuttings, 3-501.
Gerbert (later Pope *Silvester II*) (d. 1003), tutor to *Otto III*; famous as statesman and scholar; a fine musician; built organs, also clocks, globes, and other instruments; fables clustered round his name; later regarded as a magician.
Géricault (zhā'rēkōl), *Théodore* (1791-1824). Fr. painter, leader of realistic school and revolt against *David's* classicism.
Gerisdorfer. Mt. in the High Tatra, loftiest peak in *Carpathian mts.*, 8,740 ft., 2-245 illus.
Germ. Popular name for a disease-producing bacterium and protozoan. See *Germs in Disease*.
Germ. The embryo, usually small, in a seed or egg. See *Embryo*.
German, Sir Edward (1862-1936). Brit. composer; light operas *Merric England* (1902), *A Princess of Kensington* (1903), *Tom Jones* (1907); completed *Sullivan's The Emerald Isle*.
German "Democratic Republic." State established in 1918 in that part of Germany occupied by Soviet forces.
Germander speedwell (plant). See *under Speedwell*.
German Federal Republic. State established in 1948 containing the zones occupied by the forces of the United Kingdom, United States, and France.
Germanicus, Caesar (15 B.C.-A.D. 19). Rom. general, nephew of *Tiberius*; had nearly conquered Ger. when jealousy of *Tiberius* led to his recall and transfer to Syria; believed to have been poisoned at instigation of emperor.
Germanium (Ge). Chem. element; atomic no. 32; atomic weight 72.60; 3-224; 3-225.
Germanos (1771-1827). Gk. arch. bishop of *Patras*; led 1821 revolt, 4-78.
German silver. See *under Nickel*.
Germantown. Suburb of *Philadelphia*, mansions, 6-151.
Germany. Country of Europe; area 130,000-140,000 sq. m.; pop. about 67,500,000; Federal Republic (Western Germany) 96,000 sq. m.; pop. 49,000,000; cap. Bonn; (Soviet) "Democratic Republic," 41,000 sq. m.; pop. 17,500,000; cap. eastern sector of *Berlin*, 4-1; maps, 4-2, 4-6; physical features, 4-1; national anthem, 5-326; national emblem, 2-508; agriculture and mineral resources, 4-1; dyeing, 3-141; fisheries, 3-380; industrial regions of the Ruhr, 4-4, 6-468; importance of the Rhine, 6-391; autobahnen, 6-408; diesel train, 5-8 illus.; sliding, 4-33; modern architecture

Ghent, Bombard of

movement, 1-218; early films, 2-396; embroidery, 3-239; dolls, 3-104.
Germany, History of. 4-5, 3-315; German kings and the Holy Roman empire, 4-188; *Henry IV* and the investiture conflict, 4-7, 4-96; Hanseatic League, 4-128; *Luther* and the Reformation, 6-376, 5-53; the *Peasants' War*, 4-8, 6-376; *Thirty Years' War*, 7-269.
The Rise of Prussia. 6-208; *Seven Years' War*, 7-2; *Bismarck's* policies, 1-471; *Franco-Prussian War*, 3-158; army, 1-218; *Schleswig-Holstein*, 3-74; *Saxony*, 6-502; *Alsace-Lorraine*, 1-126; Moroccan question, 5-263; *Cameroons* protectorate, 2-190; *Hellgoland*, 4-159.
First World War: 3-316, 4-9, 1-83, 84, 7-478, 483-485; League of Nations, 4-164; possessions in Pacific, 6-31.
The Third Reich and Second World War: *Hitler's* policies and rise to power, 4-182, 5-328; *Danzig* question, 3-49; persecution of Jews, 4-375; *Czechoslovakia* and *Sudetenland* question, 3-22; *Hitler's* pact with Russia, 4-183, 7-486; invades Russia, 7-490; battle of the Atlantic, 1-293; battle of Britain, 2-76; unconditional surrender 1945, 7-496; atomic bomb race, 1-303; bombing, 1-514; partition of Poland with Russia, 6-240; occupation of Berlin, 1-434, 4-11; Bonn govt. formed, 4-11; dissolution of *Länder* in Soviet zone, 4-3; German "Democratic Republic" formed, 4-11; W. Germany sovereign state, 4-12.
Germany: Language. 4-12; alphabet, 1-120; in *Alsace-Lorraine*, 1-127; order of most-used letters, 2-444; *Jews* and Yiddish dialect, 4-151, 152.
Germany: Literature. 4-13; drama, 3-119; Song of the *Nibelungs*, 5-429; opera, 5-311, 515; Leipzig and Ger. book publishing, 4-176. See List of Prominent Writers in next page.
Germiston. Tn. in Transvaal, S. Africa, near *Johannesburg*. Gold mining, chemicals, hardware, agricultural implements. Pop. 102,046.
Germs in Disease. 4-14; action of disinfectants, 3-92; antiseptic cream used by laundry workers, 4-451; destroyed by ultra-violet rays, 7-344. See also *Bacteria*.
Gérôme (zhā-rōm'), *Jean Léon* (1824-1904). Fr. painter and sculptor, noted especially for his spirited portrayal of Oriental and classical scenes.
Gershwin, George (1898-1937). Amer. "jazz" composer; *Rhapsody in Blue*; also an opera, *Porgy and Bess*.
Geryon. Monster in Gk. myth.; oxen captured by *Hercules*, 4-166.
Gestapo. Secret police of Nazi Germany, 6-252, 5-329.
Gethsemane, Garden of. Place b. of *Jerusalem* in the Valley of *Kidron*, 4-361; betrayal of *Jesus* in, 4-367.
Gettysburg. Bor. of Pennsylvania, U.S.A.; battle of *Gettysburg* (1863) in Amer. civil war, 4-475; *Lincoln's* speech at, 4-511.
Geyser. Hot spring, 4-15, 7-139.
Gezira. Residential area of *Cairo* on island in the Nile, 2-165.
Gezira. A 5 million-acre triangle of land in the Sudan, 7-179-80.
Ghadames. Tn. in Sahara desert, 6-485.
Gharial. Reptile found in rivers in India, 6-388 illus.
Ghat. Tn. in Sahara desert, 6-485.
Ghats (gawts). Two mt. ranges parallel with l. and w. coasts of peninsula of India, known as *Eastern* and *Western Ghats*.
Ghats. Flights of steps leading to r. *Ganges* of *Bonares*, India; and *Hindu* pilgrims, 1-427.
Ghazi (1912-39). King of Iraq; succeeded his father *Faisal* in 1933. Killed in car accident April 1939.
Ghee. Clarified butter made in Asia; used in tea, 2-135.
Ghegs. People of *Albania*, 1-92.
Ghent. Picturesque city of Belgium; pop. 186,171; 4-16; architecture, 1-420, 421 illus.
Ghent, Bombard of. Early cannon (1382), 1-258.

GHEAT TREATY OF

Gheat, Treaty of. Ended war of 1813 between Gr. Brit. and U.S.A. (1814).
Gherkin (gér'-kin). Type of cucumber used for pickling.
Ghetto. Jewish quarter of a city. segregation of Jews, 4-375.
Ghibellines. See Guelis and Ghibellines.
Ghiberti, Lorenzo (1378-1455). It. sculptor; won competition for gilded bronze doors in relief for Baptistery of St. John, Florence (1404-24); fame rests on magnificent second pair of doors, *Paradise Gates* (1425-53) with panels on Old Testament subjects, 3-392.
Ghiorides or Turkish knot. In carpet mfr., 2-348, 348 diag.
Ghirlandajo Domenico (1449-94). It. painter, 4-318; and Michelangelo, 6-190.
Ghosts, and Hallowe'en, 4-120.
Giant Bent grass, 4-frontis.
Giant Despair, in *Pilgrim's Progress* 2-128 127 illus.
Giantism. Disease, and pituitary gland 4-28.
Giant Mts. (Riesengebirge). Highest range of Sudetic Mts. between

Czechoslovakia and Silesia; highest point the Schneekoppe (5,365 ft.).
Giant Hunt, pigeon, 6-199 illus.
Giant, 4-17.
Giant's Causeway, 4-18 with illus.; basalt columns, 3-88.
Gibberd, Frederick (b. 1908). Brit. architect, 1-219.
Gibbings, Robert John (b. 1889). Brit. engraver; did fine work on wood, including much book illustration; director of Golden Cockerel Press.
Gibbes, Edward (1737-94). Brit. historian, 4-19 with portrait; 3-288.
Gibben. Smallest of the man-like apes, 4-18; skeleton compared with Man's, 1-180, 181 illus.
Gibbons, Grinling (1648-1720). Anglo-Dutch wood carver, 4-19, 3-491.
Gibbs, James A. E. (1829-1903). Amer. inventor of a chain-stitch sewing machine, 7-10.
Gibbs, Sir Philip Hamilton (b. 1877). Brit. journalist and author; acted as war correspondent in Balkan Wars (1912-13) and 1st World War (1914-18). (*Street of Adventure, Blood Relations, European Journey.*)

Gibraltar. Tn. and rock fortress at a extremity of Spain. A Brit. crown colony; pop. 33,000; 4-20; captured by British, 8-192; relieved by Admiral Darby, 7-348 illus. (siege raised by Adm. Howe, 1783).
Gibraltar, Strait of. Western entrance to Mediterranean, 4-20.
Gibson, Charles Dana (1867-1944). Amer. illustrator; excelled as por-trayer of society life; creator of the "Gibson Girl."
Gibson, John (1790-1866). Brit. sculptor; introduced colour after Gk. fashion in tinted Venus; Sleeping Shepherd; Mars and Cupid; statue of Queen Victoria for Houses of Parliament.
Gide, André (1869-1941). Fr. novelist 3-456; memoirs *Si le Grain ne Meurt*.
Gideon (gid'-on). Hebrew judge and warrior; called by Jehovah to deliver Israel from the Midianites, 4-374.
Gielgud, Sir John (b. 1904). British actor; member of the Terry family; achieved great success in *Richard of Bordeaux, Hamlet, Romeo and Juliet* (*Richard I*) *Merchant of*

PROMINENT WRITERS IN THE GERMAN TONGUE

Berthold Auerbach (1812-82), novelist—"Schwarzwälder Dorfgeschichten" (Village Tales of the Black Forest).
Wolfram von Eschenbach (1170-1220), poet—"Parzival", "Iliurel".
Lien Fouchswanger (1884-), novelist—"Jew Süs" "The Ugly Duchess".
Theodor Fontane (1819-98), novelist and poet—"Vor dem Sturm", "Effi Briest", novels.
Friedrich de la Motte Fouqué (1777-1843), novelist and poet—"Undine" novel "Historie vom edlen Ritter Galony," poem.
Gustav Frænssen (1868-1945), novelist—"Jörn Uhl."
Gustav Freytag (1816-95), novelist and dramatist—"Die Journalisten" (The Journalists), play: "Soll und Haben" (Debit and Credit), novel.
Stefan George (1868-1933), poet—"Das Jahr der Seele" (The Year of the Soul); "Die Lieder von Traum und Tod" (Songs of Dreams and Death).
Johann Wolfgang von Goethe (1749-1832), dramatist, novelist, poet, and critic—"Die Leiden des jungen Werthers" (The Sorrows of Young Werther); "Wilhelm Meister"; "Faust"; "Hermann und Dorothea".
Franz Grillparzer (1791-1872), Austrian dramatist—"Sappho"; "Das goldene Vlies" (The Golden Fleece).
Jakob (1785-1863) and **Wilhelm** (1786-1860) **Grimm**—Fairy tales.
Gerhard Hauptmann (1862-1946), dramatist—"Die Weber" (The Weavers), "Die versunkene Glocke" (The Sunken Bell), "Hannele".
Heinrich Heine (1797-1856), poet—"Die Lorelei," and many other poems; "Reisebilder" (Pictures of Travel).
Johann Gottfried Herder (1744-1803), critic—"Kritische Wälder" (Critical Forests); "Ideen zur Philosophie der Geschichte des Menschth" (Ideas on the Philosophy of the History of Mankind).
Paul Heyse (1830-1914), dramatist, novelist, poet, and short story writer—"L'Arrabata"; "Kinder der Welt" (Children of the World), "In Paradiese" (In Paradise).
Hans Lange, play.
August Heinrich Hoffmann (Hoffmann von Fallersleben) (1798-1874), poet and song writer—"Deutschland", "Deutschland über Alles".
Hugo von Hofmannsthal (1874-1929), Austrian poet and librettist—"Elektra"; "Der Rosenkavalier".
Riearda Huoh (1864-1947), novelist, poet, and historian—"Der Fall Deruga" (The Deruga Trial); "Der grosse Krieg in Deutschland" (The Great War in Germany).
Karl Jaspers (1883-), philosopher—"Nietzsche", "Rechenhaft und Ausblick" (Reckoning and Prospect).
Franz Kafka (1883-1924), Austrian novelist—"Das Schloss" (The Castle); "Der Prozess" (The Trial); "Amerika".
Georg Kaiser (1878-1945), dramatist—"Gas"; "Von Morgens bis Mitternachts" (From Morn to Midnight).
Erich Kästner (1899-1942), novelist—"Fabian"; and children's writer—"Emil and the Detectives"; "The 36th of May" "Annaliese and Anton".
Gottfried Keller (1819-90), novelist, poet, and short story writer—"Der grüne Heinrich" (Green Henry); "Die Leute von Seldwyla" (Seldwyla Folk).
Heinrich von Kleist (1777-1811), dramatist and poet—"Kätchen von Hehlbronn" (Katie of Hehlbronn); "Der zerbrochene Krug" (The Broken Pitcher).
Friedrich Gottlieb Kleoppeck (1724-1803), Classical poet—"Der Messias" (The Messiah); odes.
Gottlieb Ephraim Lessing (1729-81), dramatist and critic—"Emilia Galotti"; "Minna von Barnhelm"; "Laokoön".
Detlev von Liliencron (1844-1909), poet—lyric poems

Emil Ludwig (1881-1948), novelist and biographer—"Napoleon"; "Bismark"; "Lincoln"; "Roosevelt".
Martin Luther (1483-1546)—Translation of the Bible; hymns.
Heinrich Mann (1871-1950), novelist—"Die Armen" (The Poor); "Mutter Marie" (Mother Mary).
Thomas Mann (1875-1956), novelist—"Buddenbrooks"; "Der Zauberberg" (The Magic Mountain); "Der Tod in Venedig" (Death in Venice); "Lotte in Weimar".
Conrad Ferdinand Meyer (1825-94), Swiss novelist and poet—"Jürg Jenatsch"; "Der Heilige" (The Saint).
Friedrich Nietzsche (1844-1900), philosopher and essayist—"Jenseits von Gut und Böse" (Beyond Good and Evil); "Also Sprach Zarathustra" (So Spake Zarathustra).
Erich Maria Remarque (1898-), novelist—"Im Westen nichts Neues" (All Quiet on the Western Front).
Johann Paul Friedrich Richter (Jean Paul) (1763-1825), humorous novelist—"Quintus Fixlein"; "Siebenkäs" "Flegeljahre" (Wild Cate).
Rainer Maria Rilke (1875-1926), poet—lyric poems.
Hans Sachs (1494-1576), master singer and dramatist—"Fastnachtspiele" (Shrovetide Plays).
Johann Christoph Friedrich von Schiller (1759-1805), poet and dramatist—"Das Lied von der Glocke" (The Song of the Bell); "Wallenstein"; "Maria Stuart"; "Die Jungfrau von Orléans" (The Maid of Orleans); "Wilhelm Tell".
Arthur Schnitzler (1862-1931), Austrian dramatist and novelist—"Anatol"; "Der Grüne Kakadu" (The Green Cockatoo); "Fraulein Else".
Arthur Schopenhauer (1788-1860), philosopher—"Die Welt als Wille und Vorstellung" (The World as Will and Idea).
Karl Spitteler (1845-1924), Swiss epic poet and novelist—"Der Olympische Frühling" (The Spring of Olympus).
Theodor Storm (1817-88), novelist, poet, and short story writer—"Immensee"; "Bei kleinen Leuten" (Among Little People).
Hermann Sudermann (1857-1928), dramatist and novelist—"Es lebe das Leben" (The Joy of Living); "Heimat" (translated as Magda); "Frau Sorge" (Dame Clare), "Die Ehre" (Honour).
Ernst Toller (1893-1939), dramatist and poet—"Masse-Mensch" (Man and the Masses); "Die Maschinenstürmer" (The Machine Wreckers); "Die Wandlung" (Transition).
Ulfilas (311?-383?)—Translation of the Bible into Gothic.
Clara Viebig (1890-), novelist—"Das tägliche Brod" (Daily Bread); "Das schlafende Heer" (The Sleeping Army).
Walther von der Vogelweide (1168?-1228?), minnesinger national poet of the Middle Ages.
Wilhelm Richard Wagner (1813-83), writer of operas—"Lohengrin"; "Tannhäuser"; "Der Ring des Nibelungen"; "Tristan und Isolde"; "Die Meistersinger"; "Parsifal".
Jakob Wassermann (1873-1934), novelist—"Christina Wahn-schaffe"; "Faber"; "Der Fall Maurizius" (The Maurizius Case).
Frank Wedekind (1864-1918), dramatist—"Frühlings Erwachen" (The Awakening of Spring).
Franz Werfel (1890-1945), Austrian novelist, poet, and dramatist—"Einander" (One Another); "Der Spiegel-mensch" (Reflected Humanity); "The Song of Bernadette".
Christoph Martin Wieland (1733-1813), novelist and poet—"Der goldene Spiegel" (The Golden Mirror); "Agathon", "Oberon".
Arnold Zweig (1887-), novelist—"The Case of Sergeant Griseha."

Venier, Lore for Love, The Lady's Not for Furning.

Giffen, Sir Robert (1837-1910). Famous Brit. statistician and political economist; for 15 years controller-general of the statistical and commercial departments of the Board of Trade (*Essay on Finance, The Growth of Capital*).

Gifford, Henri (1825-82). French engineer; pioneer of airship construction, 1-83.

Gifford, William (1736-1826). Brit. journalist and author; vehement critic of Keats, Shelley, and other poets when editor of *Quarterly Review* (1809-24).

Gigli [jé'gì], Beniamino (b. 1890). It. tenor singer; operatic debut at Itorvigo (1914); Covent Garden debut (1930).

Gijón [jehón], Sp. Port for rich mining dist. in centre of N. coast on the Bay of Biscay; pop. 110,935.

Gila monster. Type of lizard; characteristics, 4-330, 528 illus.

Gilbert, Sir Alfred (1854-1934). Brit. sculptor; designed Shaftesbury Memorial fountain (Eros), London, 6-521 illus.

Gilbert, Sir Humphrey (c. 1539-93). Eng. navigator; seeking the North-West Passage (1583) took possession of Newfoundland for Elizabeth I; lost at sea on return voyage, 1-134, 5-395.

Gilbert, Sir John (1817-97). Brit. painter and illustrator; *The Morning at Agincourt*, 1-68 illus.; Wolsey entering Westminster Hall in State, 7-466 illus.

Gilbert, William (1546-1603). Eng. physician; court physician to Elizabeth I; published a work on magnetism (1600). 5 81; coined word "electricity," 3-210.

Gilbert, Sir William Schwenk (1836-1911). Brit. playwright; with Sir Arthur Sullivan produced a series of comic operas, 4-20.

Gilbert. The C.G.S. unit of magnetomotive force. Called after William Gilbert (1540-1603).

Gilbert and Ellice Islands. Brit. colony in Pacific Ocean, 6 26; stamp, 6-30 illus., 7 34.

Gilbert and Sullivan, 4 20.

Gilboa, mt. range in Palestine, scene of battle in which Saul and Jonathan were slain.

Giles [jilz], St. (b. c. 7th cent. A.D.). Patron saint of beggars and cripples; hermit and Benedictine abbot of France.

Gilgal, anc. city in Jordan valley between Jericho and river, where Israelites first encamped after crossing the Jordan (Josh. iv).

Gill, Eric (1882-1940). Brit. sculptor, wood-engraver, type designer, author; work, 6-522 illus.; Gill Sans type, 5-248.

Gill [jil], a unit of dry and liquid measure; quarter of a pint.

Gillet [jilet'], King Camp (1855-1932). Amer. inventor of the safety-razor which bears his name.

Gillies [gil'ez], Sir Harold D. (b. 1882). N.Z. surgeon; plastic surgeon to the three services in Second World War; wrote *Plastic Surgery of the Face*.

Gillingham, tn. in Kent, on the Medway, E. of Chatham; industries include making bricks and cement.

Gillray, James (1751-1815). Brit. caricaturist; satirised all great figures of the era.

Gill Sans. A type designed by Eric Gill (1882-1940), 5-248.

Gimbals. In compass, 2-475.

Gimson, Ernest (1864-1919). Brit. furniture-designer; disciple of William Morris and re-creator of a tradition in Eng. furniture after stereotyped Victorian era; 3-494.

Gin. A spirit, 7-136; flavoured with juniper cones, 4-386.

Ginger. Plants, 4-21, 7-131 illus.

Gingerbread, Gilding the, origin of phrase, 4-16.

Gingham. Cotton or linen fabric woven from white or coloured yarn, often in stripes, and checks. Patterns are

woven and not printed. Originated in India.

Ginkgo [gingk'gō or jing'gō]. The maidenhair tree (*Ginkgo biloba*), with leaves resembling fronds of maidenhair fern; native of China and Japan.

Ginning. Process in cotton mfr., 2-518.

Ginza. Tokyo's main thoroughfare, 7-289 illus.

Gioconda, La. Name sometimes given to the painting Mona Lisa, in the Louvre, 4-483, 5-47 illus.

Giordano [jor'dah'nō], Luca (1632-1705). Italian painter; born Naples; painted with astonishing speed; called "Fa-Presto" (work fast); his works show influence of the great masters of painting (Christ Expelling the Traders; Francis Xavier; Judgment of Paris).

Giordano, Umberto (1867-1948). Italian composer; studied under Verdi. (*Andrea Chénier; Fedora; Madame Sans-Gêne*, and other operas.)

Giorgione (c. 1477-1510). It. painter, a pupil of Giovanni Bellini, 4 318; portrait of Cesare Borgia, 2 18 illus.

Giotto di Bondone (c. 1266 1337). It. painter, sculptor, and architect, 4-21, 4-317, 6-386; portrait of Dante, 3-45 illus.; campanile at Florence, 3-392 illus.

Giovanni, Don. See Juan, Don.

Giovanni da Fiesole, Fra. See Angelico, Fra.

Gipsies. See Gypsies.

Gipsy moth, plant pest, 2-136; sense of smell, 4-261.

Giraffe. Animal, 4 21, 4-20 illus. f.; in Africa, 1-56; family, 1-67 illus. f.; foot, 3-414 illus.

Girard [zhérahr'], Jean Baptiste ("Le Pere Girard") (1765 1850). Swiss educator; entered Franciscan Order; held all elements of study should serve to stimulate the ability to think.

Girasol [jir'asol], a blue-white precious opal with red play of colour, used as a gem.

Giraud [zhèrō], Henri H. (1879-1949). Fr. soldier; in 2nd World War commanded Fr. 7th Army; captured May 2, 1940, and imprisoned in Königstein, Saxony, but escaped April 1942 by Brit. submarine to N. Africa, where apt. C.-in-C. (1942-Apr. 1944) by Darian; replaced Darian as high commissioner of Fr. N. and W. Africa Dec., 1942; joint pres. with De Gaulle Free Fr. govt. in N. Africa, 1943; retired from army, April 1944; 3-511.

Giraudoux [zhèrōdō], Jean (1882-1944). French writer and diplomat; graceful, impressionistic, original style (*Lecture pour une ombre*, a novel of the 1st World War); *Bella*, a political novel; *Juliette au pays des hommes*; *Suzanne et le Pacifique*; play, *Amphitryon 38*; 3-456.

Girder. See Architectural Terms.

Girga. Tn. and former cap. of Upper Egypt, on r. Nile, 3-173.

Girgenti. Tn. in Sicily nr. s. coast; ruins of Gk. temples; the anc. Agrigentum; pop. 30,000; 7-49.

Girl Guides, 4-22.

Girls. See Women and Girls.

Gironde. Largest dept. of Fr.; area 4,140 sq. m.; pop. 858,800. Principal rvs., the Garonne and Dordogne unite to form the Gironde estuary, 50 m. long. Chief industry is cultivation of the vine. Bordeaux is the chief tn.

Girondists. Party of moderate republicans in Fr. Rev., 2-17; executions, 3-469; Marat and, 5-120.

Girtin, Thomas (1775-1802). Brit. painter in water colours, 3-261; Kirkstall Abbey, 3-271 illus.

Girton College, Cambridge, from 1948 full university status was granted by Cambridge Univ. to women students, 3-182.

Giselle, ballet, 1-351.

Gissing, George Robert (1857-1903). Brit. realistic novelist who chiefly depicted the struggling life of the shabby-genteel and the conflict between education and circumstances (*The New Grub Street*; *Born*

in Exile; *The Private Papers of Henry Ryecroft*; *The Odd Women*).

Giulio Romano [jū'liō rōmah'nō] (1492-1546). It. painter and architect (Fr. form of name Jules Roman); pupil, assistant, and successor of Raphael as head of Rom. school of painting; Apollo and the Nine Muses, 5-299.

Gizeh. Tn. of Egypt on Nile nr. Cairo. The Gt. Pyramid and the Sphinx are 5 m. w. of the tn.; 6-312, 8-184; golf course, 3-177 illus.; Sphinx, 7-130.

Gizzard. The last and most important of a bird's three stomachs; has muscular walls and grinds food with aid of fine gravel in seed and grain eaters; merely a membranous sac in carnivorous birds; discharges prepared food for absorption into intestine.

Gjellerup [yel'croop], Karl (1857-1919). Danish poet and novelist; early disciple of Georg Brandes; wrote *The Disciple of the Truth*, an anti-theological work, under his influence; later works showed deep spiritual and ethical strain.

Glace Bay. Tn. in Nova Scotia, Canada; pop. 25,686; 5-469.

Glace kid, as chrome tanned leather, 4-469.

Glaciation, in Pleistocene period, 5 165.

Glacier. A moving mass of ice, 4-25, 6-189 illus.; Alpine, 1-125, 7 212 illus. f.; in Antarctic, 1 163; and degradation of earth's surface, 6 186; glacial action in N. Amer., 5 436; in Himalayas, 4-177 illus.; as origin of lake, 4-138; in Norway, 5-462, 464 illus. f.

Glacier National Park. In Montana, U.S.A., 1,150 sq. m.

Glacier Park. Brit. Columbia, Can., in Selkirk Mts.; 468 sq. m.; series of caverns called Nakimu Caves.

Gladdon, a type of wild iris, 4 284.

Gladiator. Professional fighter in anc. Rome, 4-23, 2-404.

Gladiolus [gladi'olus]. Flower belonging to the Iris family (*Iridaceae*); most of them are native to S. Africa; flower in summer and autumn; extremely popular in Eng. as garden plant.

Gladkov [glahd'kof], Feodor Vasilievich (b. 1883). Russian novelist of industrialism (*Vement*).

Gladstone, Herbert, 1st Viscount (1854-1930). Brit. politician, youngest son of William Ewart Gladstone; was home secretary (1905-9) and governor-general of S. Africa (1909-14).

Gladstone, William Ewart (1809-98). Brit. Liberal statesman, 4-26; and Asquith, 6 21; and Huxley, 4-212; and Liberal party, 4-485; Queen Victoria and, 7 399.

Glaisher, James (1809-1903). British aeronaut; founded Meteorological Society in 1860; helped to found Aeronautical Society (1866); made several balloon ascents, reaching 28,000 ft. with H. T. Coxwell in 1862; 1-354.

Glamis [glahmiz] Castle, Angus, Scot. Seat of the earls of Strathmore, family of Queen Elizabeth, consort of George VI, 3-236, 1-151 with illus.

Glamorganshire. Co. of Wales; area 813 sq. m.; pop. 1,201,989; co. town Cardiff; 4-27.

Gland. Anatomy, 4-27; in skin, 7-63.

Glanders. An infectious disease, common among horses and asses, less frequently attacking cattle and other livestock; ulcers, pus discharge from lungs, and high temperature are characteristics.

Glanville Fritillary butterfly, 2-141 illus.

Glarus. Cap. of Swiss canton of same name, 43 m. from Zürich; cotton mills, breweries.

Glasgow. City and apt. on r. Clyde, Lanarkshire, Scot.; pop. 1,089,555; 4-28, 6-510.

Glasgow University. Founded 1451 by Bishop Turnbull; co-ed. since 1893; retains many medieval customs, including student election of rector;

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faculties of arts, science, medicine, divinity, law.
Glasgow, Ellen (1874-1945). Notable American woman writer; a social satirist of the South, 7-365.
Glas Moel. Mt. of Angus, Scot., 3,502 ft., 1-151.
Glass. A supercooled liquid, 4-30, 4-520, 3-6; grinding camera lenses, 4-481 illus.; Czech glassware, 3-24 illus.; etching on, 4-120; Faraday's work on, 3-341; glass models, 4-32, 33 illus. f.; for lenses, 4-482; for mirrors, 5-225; Phoenician, and, 6-161; pumice as form of, 6-305; sand, 6-496; silicon in, 7-53.
Glass, Loeh, Ross and Cromarty, Scot., 6-455.
Glastonbury. Tn. in Somerset, on r. Brue; ruins of 12th-cent. abbey; "Glastonbury thorn," a variety which flowers once a year at Christmas, said to have sprung from the staff planted by Joseph of Arimathea, who was reputed to have built here first Christian church in Eng.; abbey, 1-3; Arthurian legends, 7-85; Glastonbury thorn, 4-142; lake dwellings, 4-440.
Glauber (glow'ber), Johann Rudolf (1604-63), Ger. chemist, discovered (1658) Glauber's salt; used medicinally; production of nitric acid, 5-442.
Glaucous. Dull green amorphous silicate of iron and potassium; as much as 90 per cent. in green sand.
Glaze, for pottery and bricks, 6-276, 2-60.
Globe. Land belonging to a church living for the support of the parson.
GLEEP. Nuclear reactor at Harwell; Graphite Low Energy Experimental Pile, 1-302 illus.
Glen Affric, Scot.; hydro-electric scheme, 4-220 illus.
Glenariff, co. Antrim, N. Ireland; one of the "Nine Glens of Antrim," 1-178.
Glencoe, Scot. Glen 60 m. N.W. of Glasgow; wild scenery; massacre of MacDonalds by royal troops in 1692, 1-227, 6-514 illus.
Glendower, Owen (1359-1415). Welsh chief and nat. hero; last Independent Prince of Wales and leader in last war for Welsh independence; 7-413.
Glenmore. Glen extending from Fort William to Inverness, Scot., 2-86, 4-275.
Glen Roy, Inverness-shire, Scot.; the Parallel Roads, 4-275.
Glen Trool, Kirkcudbrightshire, Scot.; Robert Bruce at, 4-415.
Glider and Gliding, 4-33; Cayley's work on, 1-31; and force of gravity, 4-64 illus. f.; Lilienthal's experiments, 1-37; on Dunstable Downs, 1-404 illus.
Glider Pilot Regiment, 1-252.
Glinka (glu'ka), Michael Ivanovich (1803-57). Pioneer of modern Rus. school of national music; operas, 5-306, 5-515.
Globe artichoke (*Cynara scolymus*), 1-257 with illus.
Globe flower, sepals and petals, 3-400.
Globe Theatre, Southwark, London, 7-13 illus.
Globin, a protein contained in haemoglobin, 1-489.
Glockenspiel. Percussion instrument, 5-307.
Glommen, Norway. Largest of the rivers in Scandinavian peninsula; rises in Dovrefield tableland and flows s. 350 m. entering Skagerrak 50 m. S.E. of Oslo; 5-462.
Gloos'kap. A demi-god in myth. of N. Amer. Indians.
Gloriana (glaw'ria'na). In Spenser's *Faerie Queene*, representation of Queen Elizabeth I.
Gloriana ornata. Moth, 2-142 illus.
Glorious Revolution of 1688. In Eng. hist., 3-280; Marlborough's support for William, 5-132.
Glossary. Type of dictionary, 3-88.
Glossop. Tn. in Derbyshire, Eng., 13 m. by rly. E. of Manchester. A cotton town. Industries include dyeing,

bleaching, paper making, calico printing, canning. Pop. 18,014.
Gloster Javelin, jet fighter, 4-369 illus.
Gloster Meteor, jet fighter; early type, 1-31 illus.; 4-368 illus.
Gloucester, Duke of (b. 1900). Henry, third son of George V; m. Lady Alice Scott, d. of 7th Duke of Rutland, in 1933; has two sons, b. 1911 and 1941; gov.-general of Australia, 1913-47.
Gloucester (glos'ter). City and co. tn. of Gloucestershire, on Severn; pop. 67,268; has railway, eng., and aircraft works, flour mills and numerous other industries; canal joins tn. to Bristol; 4-31, 7-5; relief of Gloucester (1643), 2-307.
Gloucester, Massachusetts. Leading fishing port in U.S.A. and one of largest in world; on Cape Ann, 27 m. N.E. of Boston; pop. 25,167.
Gloucestershire. Co. of England; a. 1,213 sq. m.; pop. 938,618; co. town Gloucester; 4-34.
Glove puppets, 6-310.
Gloves, 4-35.
Glow-worm, 4-36; purpose of light, 1-116; bio luminescence, 6-162.
Glowworm, H.M.S., ram, *Hipper*, 5-310.
Glubb, Sir John Bagot, "Glubb Pasha" (b. 1897). Brit. soldier; in Iraq, 1920-30; commanded Arab Legion, Jordan, 1939-56, 4-382; K.C.B., 1956.
Glucinum (gloo's'num). Another name for the element beryllium (q.v.).
Gluck, Christoph Willibald (1714-87). Ger. composer; earliest of great modern opera writers, and first to make opera truly dramatic, suiting the music to the character by whom it is sung; chief work *Orfeo*.
Glucose. A variety of sugar, also called dextrose or grape-sugar, 4-36, 7-186; in boiled sweets, 7-150; and cellulose in young vegetables, 2-288; excess in diabetes, 4-270; formed by plants, 6-182; in fermentation, 1-96.
Glue, 4-36; from hides, 4-466; plastic glue, 6-220.
Gluten. Mixture of proteins (chiefly gliadin and glutenin), made from wheat flour by washing the starch out of dough. Bread and biscuits made from gluten can be eaten by diabetics; 2-52, 7-150.
Glycerine, 4-36; in soap, 7-80.
Glycerol. Refined form of glycerine, 4-37.
Glycogen. Form in which glucose is stored in the body, chiefly in the liver; during exertion glycogen in the muscles is converted to glucose and consumed; during rest it is replenished, 4-524, 4-36, 7-150.
Glyder Fach. Mt. in Snowdonia, Wales; height 3,262 ft., 7-77.
Glyder Fawr. Mt. in Snowdonia, Wales; height 3,279 ft., 7-77.
Glyndebourne. Estate near village of Glynde in Sussex, 3 m. S.E. of Lewes. Famous for its summer seasons of opera; 5-516.
Glyptic sculpture, defined, 6-519.
Glyptodon (Gk. "fluted tooth"). A very large armadillo-like animal of S. Amer., now extinct; attained size of an ox; had very strong limbs with short broad feet; teeth were deeply grooved or fluted, 1-242.
Gnat. Insect; egg laying, 3-172; compared with mosquitoes, 5-271.
Gneiss. Form of rock structure, coarse-textured and crystalline. Chief constituents are quartz and feldspar. In appearance, resembles streaky granite.
Gnetales. Group of plants, found chiefly in warm regions, intermediate between Angiosperms and Gymnosperms; *Ephedra*, typical example, shows resemblance to conifers; (*Netum*) converges to flowering plants; reproductive organs cone-like, leaves scale-like.
Gnomon. Name given to the inclined style of a sundial, 2-412.
Gnosticism (nos'tis'izm). Movement within early Christian Church (flourishing in 2nd and 3rd centuries) combining elements of Christian, Jewish, Greek, and Oriental philosophies; held knowledge, obtained

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from revelation, not faith is key to salvation.
Onu or Wildebeeste. Antelope of S. Africa, 1-171.
Goa. Portuguese territory in India; area 1,435 sq. m.; pop. 540,000; 1-517, 4-240, 6-268.
Goat. Domesticated ruminant, 4-37; milk from, 5-203. For wild species, see also ibex.
Goat. (*Capricornus*), one of the 12 signs of the Zodiac, 7-524 illus.
Goat Fell. Highest point on Arran Is. (2,866 ft.), Buteshire, Scot., 2-131.
Goat Island. Isl. in centre of Niagara r., dividing the Niagara Falls, 5-427 illus.
Goat's-beard. Member of the *Compositae* order with large, yellow, dandelion-like flowers; also known as Jack-go-to-bed-at-noon.
Goat-sucker. See Nightjar.
Gobelin (gob'lin). Famous French tapestries, made in Paris; so named from a family of dyers of name of Gobelin who owned building in which tapestry industry was established in 16th cent. The industry is maintained by the French govt.; 3-439.
Gobi. Desert in cent. Asia, mainly in Mongolia and China, 1-265; life in 5-236, 3-78, 2-410 illus.
Goblins. Grotesque fairies, similar to gnomes and kobolds; they are sometimes evil and malicious and sometimes only playful and tricky. See Fairies.
Godard, Benjamin Louis Paul (1849-95). French composer; works for orchestra, violin, piano, songs, chamber music, operas (*Jocelyn*).
Godavari. Large r. in S. India; rises N.E. of Bombay in W. Ghats, flows 900 m. S.E., entering Bay of Bengal by 7 mouths; navigable for 300 m., 4-240.
Goddard, Rayner Goddard, Baron (b. 1877). Brit. judge; from 1946 lord chief justice; advised rejection of experimental suspension of death penalty for five years, in 1948.
Godfrey of Bouillon (goh'yoon') (c. 1061-1100). Leader in First Crusade, and first Christian ruler of Jerusalem, hero of Tasso's *Jerusalem Delivered*, 3-12, 3-119.
Godiva, Lady (11th cent.). Wife of Leofric of Mercia; legend concerning 2-522.
Godmanchester. Tn. in Hunts, Eng., pop. 2,499; 4-210.
Godowsky (goh'of'ski), Leopold (b. 1870). Russian-American pianist and composer, born Vilna (Vilno); piano phrases of Bach, Chopin, Johann Strauss; many original compositions.
God Save The Queen (King). Brit. national anthem, origin of tune and words, 5-325.
Godthaab. Settlement in S.W. Greenland.
Godwin, Mary Wollstonecraft (1759-97). Eng. women's rights advocate (1 indication of the Rights of Woman) wife of William Godwin, a political philosopher and novelist; mother of Shelley's wife, Mary.
Godwin, Mary Wollstonecraft (1797-1851). Second wife of P. B. Shelley. wrote *Frankenstein*, the story of a monster, 7-26.
Godwin, William (1756-1830). Brit. writer; rather-in-law of Shelley, 3-289.
Godwin-Austen or K2. Second highest mt. in Himalayas, 28,258 ft. high, also called Dapsang, 1-264, 4-176 (Climbed by Italians in 1954).
Goebbels (ge'biz), Paul Josef (1897-1951). German politician; appointed Reich minister for propaganda, 1933. Committed suicide May 1945.
Goering (gö'ring), Herman Wilhelm (1893-1946). German; politician "are" of German air force during 1st World War; Pres. of Reichstag (1932), Reich min. for Air Force (1933); supreme commander Air Forces (1934); 1937 superseded Schacht as economic dictator; Field Marshal Feb., 1938; Air minister, etc., 1939-45; war criminal; committed suicide Oct. 1946.

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Goes, Hugo van der (c. 1435-82). Flemish painter, 5-381.

Goethals, George Washington (1858-1928). Amer. army officer and engineer; and Panama canal, 6-54.

Goethe, Johann Wolfgang von (1749-1832). Ger. poet, novelist and philosopher, 4-37, 4-13; *Faust*, 3-343; and Schiller, 6-502; birthplace, 3-460.

Gog and Magog. Heathen prince and country (Ezek. xxxviii xxxix); in Brit. legend, two giants whose effigies are kept in London Guildhall; destroyed in Great Fire, 1666, replaced and again destroyed in 2nd World War; new effigies were installed in 1953; 4-17.

Gogol, Nikolai (1809-52). Russ. novelist, 6-180, 5-472.

Goutre. An enlargement of the thyroid gland; and deficiency of iodine, 4-28; 4-276.

Golconda [golkon'da], India. Ruined city 5 m. W. of Hyderabad; famous as diamond-cutting centre in 16th cent.; named hence associated with fabulous wealth.

Gold (Au). A precious metallic element; atomic no. 79; atomic weight 197.2; extremely malleable and ductile, 4-38, 3-224; and acids, 1-12; in Alaska, 1-88, 90; alloys, 1-114, 1-115; in Australia, 1-318; crystal, 3-1 illus.; drilling, 1-320 illus.; from mercury, 1-93; as one of earliest metals used by Man, 5-176; as money, 5-235; and rates of exchange, 3-419; in S. Africa, 7-88; discovery in Transvaal, 1-502; in U.K. coinage, 5-223; *verish gold*, 5-175.

Gold Coast. British colony of W. Africa; area (with Ashanti and Northern Territories, and trusteeship territory of Togoland), 91,843 sq. m.; pop. (1948) 4,118,450; cap. Accra; 4-44, 7-110; Eng. settlement (1601) 2-308; school, 1-53 illus.; vegetable oils from, 1-56.

Gold Coast University College. Opened Oct. 1948; at first sharing buildings of Achimota College, Gold Coast.

Goldencrest. The so-called golden crested wren (*G.C.*).

Golden Age, The, in Latin literature, 4-150.

Golden Apple, given by Paris to Aphrodite, 7-320.

Golden Apples, The Three, in *Atalanta myth*, 1-285.

Golden Arrow, The. British express train running between London and Dover, and Calais and Paris; a French train in reverse direction is called *Répète d'Or*, 5-9 illus.

Golden Bough, Legend of the, 3-161.

Golden Bull. Originally any charter with golden seal or bulla; especially that issued (1356) by the Emperor Charles IV, 4-8.

Golden Calf. Image made by Israelites from their earrings at instigation of Aaron while Moses was absent on Mount Sinai receiving the Ten Commandments.

Golden-crested wren. Bird; nest, 1-459 illus., 7-500.

Golden Dawn. Variety of rose, 6-452 illus. f.

Golden Eagle, 3-115 with illus.

Golden Fall, power station, Ireland; 4-219 illus.

Golden Fleece. The prize of the Argonauts; a ram's fleece of pure gold hung on a tree in a sacred grove in Colchis, 1-26; Theseus and, 7-269.

Golden Fleece, Order of the. Austrian and Spanish order of knighthood, 5-530.

Golden Gate, The. Channel about 2 m. wide at entrance to San Francisco Bay, California, U.S.A., 6-496.

Golden Gate suspension bridge, San Francisco, U.S.A., single span of 1,200 ft., 2-87, 66 illus., 6-497.

Golden Hind. Ship in which Sir Francis Drake circumnavigated the globe. Displaced 100 tons, 3-114.

Golden Horn. An inlet of the Bosphorus which provides a natural harbour for Istanbul, Turkey, 4-303, 2-21, 7-334 illus.; bridges, 4-304, 2-68.

Golden oriole. Bird; species of oriole found in Europe, 6-4 with illus.

Golden pheasant. Bird, 6-153.

Golden plover. Bird, 6-226, 227 illus.; egg, 1-452 illus. f.; migration, 1-456.

Golden retriever. Dog, 3-101 illus. f.

Golden Rose. A papal honour, probably established in the 11th cent.; awarded to Queen of Italy by Pope Pius XI in 1937.

Golden Rule. "Whatsoever ye would that men should do to you, do ye even so to them" (Matthew vii. 12, and Luke vi. 31); of Confucius, 2-480. "Do as you would be done by."

Golden Temple, Benares, India, 1-127 illus.

Golden wedding. Fiftieth anniversary of a wedding. Other special wedding anniversaries are the twenty-fifth (silver); thirtieth (pearl); fortieth (ruby); sixtieth (diamond).

Goldfinch. Bird, 3-352 with illus.

Goldfish, 4-41; in aquarium, 1-188.

Goldilocks. Woodland buttercup, 2-136.

Gold leaf. In gilding, 4-10.

Gold nibs, for fountain pens, 6-112.

Goldoni [goldō'ni], Carlo (1707-93). It. dramatist, founder of modern It. comedy; *The Coffee House*, *Pamela* and *La Locandiera* (Eng. adaption *Mirandolina*) his best plays; wrote several plays in Fr.; 4-330, 3-119.

Gold Rush, The (1925). Film by Charles Chaplin; scene from, 2-397 illus.

Goldsmith, Oliver (1728-74). Anglo-Irish poet, essayist and dramatist, 4-42, 3-288, 3-121; *The Vicar of Wakefield*, 5-171.

Goldsmiths' Company, 4-526; as bankers, 1-363; examination of coinage, 5-221.

Gold Standard, 4-43.

Golf. Game, 4-44.

Goigotha. See *Calvary*.

Goliath. Philistine giant killed by David, 4-17, 3-51.

Goliath crane. In engineering, 2-525.

Goliath goliathus. Giant beetle of W. Africa, 1-414 illus.

Goliwog. Toy; origin, 3-104.

Goltz, Colmar von der (1843-1916). Prussian general and military writer; reorganized Turkish army (1883-95); gov.-gen. of Belgium (1911); commanded Turkish army in Mesopotamia (1915-16).

Gomez, Estevan (16th cent.). Portuguese sailor in service of Spain; N. Amer. explorations (1524-5), 1-134.

Gommies. Light boats made by the Caribs of Dominica, Windward Is., 1-500 illus.

Gomorrhah. See *Sodom and Gomorrhah*.

Gompers, Samuel (1850-1924). Amer. labour leader; one of the outstanding figures of the Labour movement; pres. of the Amer. Federation of Labour for about 10 years.

Goncharov [goncharof'], Ivan Alexandrovitch (1812-91). Russ. novelist, wrote *Oblomov*, "masterpiece that ranks with the best work of Tolstoy and Turgenev," which gave Rus. the term "Oblomovism" as a synonym for diseased will and indolence.

Goncourt [gonkōr], Edr. and de (1822-96). Fr. novelist and historian; in collaboration with his brother Jules (1830-70) wrote minute valuable studies of Fr. society in 18th cent.; novels continued naturalistic method of Flaubert (*Germinie Lacerteux*, *Renée Maupérin*), a convincing story of Parisian society girl; 5-472, 3-456.

Gondar. Religious centre of Abyssinia; cap. of Amhara prov.; in the N., 250 m. from Red Sea; pop. 22,000; has gold and silver mines; mfrs. cotton and leather goods.

Gondokoro, Sudan; Eg. village on Upper Nile; formerly centre of slave and ivory trade; steamer services, 3-173.

Gondola. Italian long, narrow, flat-bottomed boat, curved at prow and stern; at Venice, 4-313 illus.

Gondola. Passenger car in airship or balloon, 1-83, 1-354.

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Gonds. People of India living in hill dists. of Uttar Pradesh; characteristics, 4-241.

Goneril. Daughter of King Lear in the tragedy by Shakespeare, 4-108.

Gonville and Caius College [kæz]. Cambridge University, 2-182.

Gonzales [gonzäh'ez], Manuel (1833-93). Mexican general, close friend of Diaz; succeeded Diaz as pres. 1880-84, when he resigned in his friend's favour.

Goodall, Frederick (1882-1904). Brit. artist. Member of a family of painters; did many pictures, very popular in reproductions. Many of his scenes are set in Egypt and the near East.

Good Companions, The (1929). Novel by J. B. Priestley, 6-286.

Good Friday. Name given to Friday in Holy Week, on which the Crucifixion of Jesus Christ is commemorated.

Good King Henry. Plant; leaves, 4-171 illus.

Goodwin Sands. Dangerous shoals at entrance to Strait of Dover, separated from mainland by the Downs, a roadstead of Eng. Channel.

Goodwood. 3 m. N.W. of Chichester, seat of Duke of Richmond and Gordon. Near by is racecourse where races are held annually at the end of July. Principal event, the Stewards' Cup, 2-335.

Goodyear, Charles (1800-60). Amer. inventor; discovered method of vulcanising rubber, 6-165.

Goosander. A saw-bill duck, 3-131.

Goose. Web-footed bird, belonging to the same family as ducks and swans, 4-46; incubation of eggs, 1-100.

Gooseberry. Fruit, 4-47; section of ovary, 3-395 diag.

Goose Fair, Nottingham, Eng., 5-468.

Goose step. Ceremonial march of former German army. Performed at 75 paces to the minute.

Gopher [gōfer]. A species of burrowing rodent; *Geomys*, the European variety, is not unlike the squirrel, but the tufted tail and ears are absent.

Gorbals, The. Slums of Glasgow, Scot., 4-29.

Gorboduc (c. 1561). First Eng. tragedy by Sackville and Norton, 3-284.

Gordian knot. Alexander and, 1-98.

Gordon, Adam Lindsay (1833-70). Australian poet, 1-321.

Gordon, General Charles George (1833-1885). British soldier ("Chinese Gordon"), 4-47; failure to relieve in Sudan, 4-115; death at Khartum 4-102.

Gordon, Lord George (1751-93). Brit. agitator; headed anti-Catholic movement which resulted in "Gordon Riots" of 1780.

Gordon, Patrick (1635-99). Scot. military adventurer; fought in war between Sweden and Poland, first for one country and then the other; eventually rose to high and confidential position in the service of Peter the Great of Russia.

Gordon Bennett Cup. Annual award for balloon flight, 1-354.

Gordon Highlanders. Scot. Highland regiment of Brit. army. Formed, 1794, by the Marquess of Huntley, afterwards 5th Duke of Gordon. At Waterloo (1815) the Gordons made their famous charge hanging on to the Scots Greys' stirrups.

Gordon Riots. "No popery" riots in 1780, named after the leader, Lord George Gordon, who resented the withdrawal of certain restrictions on Rom. Catholics; described in Dickens's *Barnaby Rudge*; and Bank of England, 1-363.

Gore, Charles (1853-1932). Brit. theologian; canon of Westminster (1894-1902); bishop of Worcester (1902-4); bishop of Birmingham (1905-11); bishop of Oxford (1911-19); author of many works on theological subjects.

Gorgas, William Crawford (1854-1920). Amer. army officer and sanitary engineer; he completely wiped out the yellow-fever plague in Havana during the Sp.-Amer. War, and waged

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a successful war against disease during the building of the Panama Canal, 6-54, 6-165.

Gorge. Type of river valley, 6-188; formation of, 7-375.

Gorget. In armour, 1-244.

Gorgias [gôr'gi-as] (about 480-380 B.C.). Gk. orator and sophist noted for florid eloquence; one of Plato's dialogues is named after him.

Gorgons. In Gk. myth, three female monsters; and Athens, 1-286; and the Amazons, 1-130; Medusa and Perseus, 6-128.

Gorgonzola. Tn. in Lombardy, It., centre of cheese-producing district, 2-315.

Gori. Tn. in Georgia, S.S.R., bordering Black Sea; Stalin's birthplace, 2-278.

Gorilla. Largest of the anthropoid apes, 4-48; compared with Man, 1-180, 181 illus., 1-56.

Gorki, Maxim (1868-1936). Russ novelist, 6-480.

Gorki. Tn. in R.S.F.S.R.; pop. 644,000; formerly Nijni-Novgorod; great trade centre, 6-472.

Gorlitz [gôr'litz], Poland. Wealthy industrial tn. of Silesia on r. Neisse; pop. 94,000; fine Renaissance architecture; under Polish admin. from 1945; Polish name, *Zgorzelec*.

Gorm the Old. King of Denmark, 900-940, 3-74.

Gorontalo. Tn. of Celebes, Indonesia; pop. 15,000; 2-286.

Gorse, Furze, or Whin. Shubby plant of genus *Ulex*, order *Leguminosae*; very conspicuous on heaths and commons with masses of yellow bloom, especially in March, though flowers all year. Autumnal and dwarf gorse are separate species; 3-399.

Gorsedd [gôr'sed]. Open-air ceremony of the Eisteddfod, 3-207.

Gort, John Standish Surtees Prendergast Vereker. 6th Viscount (1886-1946). Brit. general; won V.C. in 1918; appointed C.I.G.S., 1937; c.-in-c. H.E.F., 1940-3, 136, 7-186; gov. of Gibraltar, 1941-42, and of Malta, 1942-44; c.-in-c. Palestine, 1944-45, field-marshal, 1943.

Goshen [gôr'shen]. George, 1st Viscount (1831-1907). Brit. statesman and financier; broke with the Liberal party on Home Rule; first lord of Admiralty (1871 and 1895-1900), and chancellor of exchequer.

Goshawk. Bird, 4-140.

Goshen. The region in Egypt occupied by the Israelites, W. of modern Suez (anal. Gen. xiv, 10).

Gos'old, Bartholomew (d. 1607). Eng. navigator, explorer of New England, leading colonist of Jamestown, Virginia, U.S.A., 1-131.

Gospels. The. The first four books of the New Testament (Matthew, Mark, Luke, John) giving account of life and teachings of Jesus Christ, 4-363; probable dates of, 1-411.

Gosport. Tn. on W. side of Portsmouth harbour; pop. 58,246; 6-265.

Gosse, Sir Edmund (1849-1928). Brit. poet, biographer, and critic, son of P. H. Gosse; wrote lives of Gray and Congreve, recollections of his father and his own early life in *Father and Son*, also *History of 18th Century Literature*, etc.

Gosse, Philip Henry (1810-88). Brit. naturalist of pre-Darwinian school; author of several works on marine life (*The Ocean; The Romance of Natural History*).

Göta Canal. 240 m. long. Connects Gothenburg with Stockholm, 7-201 with illus.

Göteborg (Sweden). See Gothenburg.

Göteborg. Former Ger. name for Gdynia (p.v.).

Götha [gôr'tah]. Ger. mfg. tn. on Leine canal, 80 m. S.W. of Leipzig; pop. 45,780; formerly joint cap. with Coburg of Duchy of Saxe-Coburg-Gotha; gave name to type of large aeroplane which bombed Eng. during 1st World War.

Go'tham. A vil. in Nottinghamshire, inhabitants of which are said to have

played the fool in order to dissuade King John from settling there and burdening them with expense of royal residence; hence called "Wise Men of Gotham." Also nickname of New York City from alleged pretensions of its people to wisdom; first used by Washington Irving in *Nathania undi* (1807).

Gothenburg (Göteborg). Second city, chief port, and important mfg. centre of Sweden, on S.W. coast at mouth of r. Göta; pop. 358,194; 7-201, 202 illus.

Gothic architecture. 1-211, 7-112, 113 illus. See also Cathedral.

Gothland. See Gotland.

Goths. Anc. Teutonic peoples, 4-48, migrations, 5-204; and Rom. empire, 5-198.

Götterdämmerung [gôr'ter-dä'möong]. or "Twilight of the Gods." Opera by Wagner, 5-320.

Gottfried von Strassburg (c. 1200). Ger. poet, 4-13.

Göttingen [gôr'tingen]. Ger. tn. 80 m. S. of Hanover, in the Land of Lower Saxony; noted univ., founded by George II.

Gotland or Gothland. Largest isl. in Baltic Sea, r. of Sweden, to which it belongs, 1,220 sq. m.; pop. 59,273.

Gottwald [gôr'valt]. Klement (1896-1953). Czechoslovak pres.; sec. gen. Communist party, 1929; in 1946 premier of left-wing coalition; Gottwald's Communist Constitution was rejected by Benes, who resigned and was succeeded by Gottwald as president, 1948; 3-24.

Gouda. Tn. in Netherlands. Industries include candle, cigar, and pottery factories, and making Edam cheese. Pop. 38,150.

Gough [gof]. Sir Hubert (b. 1870). Brit. general, commanded Fifth Army during 1st Somme offensive, March 1918, being recalled for his inability to hold Germans from breaking Brit. lines; later exonerated from personal blame for the defeat.

Goujon, Jean (c. 1615-67). French Renaissance sculptor and architect; best known works are Diana and gallery for musketeers in the Louvre.

Goulash. Thick stew made from beef and flavoured with red peppers; a Hungarian dish.

Gould, Sir Francis Carruthers (1844-1925). Famous Brit. political cartoonist and journalist; much of his best work appeared in the *Westminster Gazette*.

Gould, Jay (1836-92). Amer. self-made capitalist; early associate of Daniel Drew and James Fiske in manipulating Erie railroad stocks; gained mastery over what became the Gould system of railways.

Gounod, François Charles (1818-93). Fr. composer; opera *Faust*, 5-516, 517 illus., 3-343.

Gourami. Species of tropical aquarium fish, 1-188, 189 illus. f.

Gourd. Name of various annual climbing or trailing plants, family *Cucurbitaceae*, native to warm countries. The fruits or gourds vary in shape and length. Some are edible.

Gourde. See Money (table).

Gourmont, [goor mon], Rémy de (1858-1915). Fr. critic and poet, second only to Anatole France as an authority on contemporary Fr. literature; defender of naturalism of Huysmans and symbolism of Mallarmé; wrote several volumes of "symbolist" poetry.

Gourock. Spl. on r. Clyde, Renfrewshire, Scot., pop. 9,107; 6-388.

Government. 4-49; democracy, 5-69; international law, 4-459; law, 4-457; police, 6-247; politics, 6-254; prisons and punishment, 6-290; taxation, 7-230. See also under various countries, names of political parties, Parliament, etc.

Governor, mechanical. In lifts, 4-496.

Governor-General. Appointed by the crown to represent its authority in the self-governing territories and in certain colonies; other colonies have a governor; in Canada, 2-201,

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Governor's Island. New York City, 5-413 with illus.

Gower, John (c. 1325-1408). Eng. poet, called by Chaucer "moral Gower"; chief work, *Confessio Amantis*, includes many moral stories for purpose of warning a lover against the vices of that day, 3-284.

Gower Peninsula. Glamorganshire, Wales; 4-27 with illus.

Gowrie, John Ruthven, 3rd Earl of (c. 1578-1600). Scottish nobleman killed, with his brother Alexander, in apparent attempt to assassinate King James VI of Scotland; some evidence that "Gowrie's Conspiracy" may have been a story contrived to hide the king's fault in a personal quarrel which led to violence.

Gowrie, William, 1st Earl of (c. 1541-84). Scottish nobleman; concerned in murder of Rizzio in 1566, custodian of Mary Queen of Scots at Lochleven; captured James VI of Scotland. Executed for treason by order of James.

Goya y Lucientes, Francisco José de (1746-1828). Span. painter and etcher 4-53, 7-121; paintings, 7-119 illus, 7-137 illus.

Goyen, Jan Josephzoon van (1596-1656). Dutch landscape painter.

Gozo [gôr'zô] or **Gozo.** Brit. isl. in Mediterranean, incl. in the colony of Malta; 26 sq. m.; pop. 23,000. Victoria chief town, 5-88.

Gozzi [gôr'zê], Carlo (1722-1806). It. dramatist; plays include satirical plays founded on fairy tales, and tragedies with a comic element like *Turandote* is the best known 3-119.

Gozzoli, Benozzo (d. 1498). It. painter Augustine of Hippo, 1-308 illus.

Gracchus, Gaius Sempronius (153-121 B.C.). Rom. tribune who tried to better the life of the poor in anc. Rome, 6-131.

Gracchus, Tiberius Sempronius (167-133 B.C.). Roman tribune; proposed agrarian laws and other reforms for relief of poor, killed in a riot, 6-433.

Grace, William Gilbert (1818-1914). Famous Eng. cricketer, entered first-class cricket at 15, and from then until he retired in 1899 scored over 34,000 runs; batted 126 three-figure innings in first-class cricket, made ten double centuries, and three treble centuries, and three scored a century in each innings. As bowler, he took over 2,400 wickets, and once took all 10 wickets (against Oxford Univ.) In seven seasons he made over 1,000 runs and took over 100 wickets. Captain of Gloucestershire and England; 1-398 illus.

Grace. In religion, the enjoyment of God's favour; spiritual gift of God by which Man is able to choose the right and find salvation; in Roman Catholic Church the state of grace is held to be obtained through the sacraments. The term is also used for a prayer before or after a meal asking a blessing or returning thanks.

Grace Abounding (1668). John Bunyan's story of his own life, 2-126.

Grace and favour apartments. Hampton Court, 4-128.

Grace note. See Musical Terms.

Graces. In Gk. myth., three daughters of Hera and Zeus; 1. Euphrosyne (joyfulness), 2. Aglaia (brightness), and 3. Thalia (bloom), goddesses of gladness and charm.

Gracian [grah-th'ahn']. Baltasar (1601-58). Sp. writer and Jesuit; style concise and epigrammatic, but sometimes obscure; best known philosophical novel, *El Criticon*, in *El Discreto* describes typical gentleman.

Gradation. In physiography, 6-186.

Græce [grê's]. In Gk. myth., the grey ones, "three sisters, Dina, Ena and Pephredo, daughters of Ceto and Phorcys, grey-haired from birth

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Græta (græ'ta). Heinrich (1817-91). German historian; most noted for his scholarly history of the Jews.

Grail Ship. Admiral. German war-ship. In 2nd World War. 7-459.

Grafting. of fruit trees, 3-478, 479 illus., 3-504.

Gräf Zeppelin. German airship, built 1928, 1-84.

Graham, Thomas (1805-69). Brit. chemist, originated term "colloids," and discovered "Graham's law," that diffusion rate of gases is inversely as square root of their densities; 2-455.

Graham, Kenneth (1859-1932). Brit. writer, author of *The Wind in the Willows*, *The Golden Age*, and *Dream Days*; 2-354.

Graham-White, Claude (b. 1879). Brit. aviator. Made first night flight (1910), 1-39.

Graham Land. A peninsula of Antarctica, mountainous, desolate and icebound; Rymill expedition, 6-247; meteorological survey bases, 1-170; plants in, 1-164; 3-339.

Grahamstown. Tn. in Cape of Good Hope, S. Africa; white pop. 23,000; ships ostrich feathers; Rhodes Univ. College, St. Andrew's College.

Grail, Holy. In legend, the cup used by Christ at the Last Supper, 4-54; Arthurian legends, 1-256, 6-458; Lothegrin and, 5-18.

Grain. Unit of weight, supposed to be the average weight of a grain of wheat taken from the middle of a ripe ear. It is 1/7,000 part of a pound avoirdupois. In troy weight 480 grains equal an ounce; 24 grains one pennyweight.

Grain, of wheat, 7-447 448 with illus.

Grain. Name given to the chick pea in India, where it is grown as food, 6-99.

Granger, Percy A. (b. 1882). Australian composer and pianist; collector of folk songs; composed "Shepherd's Hey," "Molly on the Shore," "Hallel in the Strand"; 1-321.

Grainne. See **Grania**.

Gram. Unit of weight in the metric system. Defined as the weight of 1 c.c. of distilled water at 4°C., and corresponding to 15.4323 grains.

Gram Calorie. Unit of heat. It is the quantity of heat required to raise the temperature of one gram of water, at 15° C., by one degree centigrade. A calorie is equal to 4.18 joules.

Gramineae. The grass family. See **Grass**.

Grammar, 4-54; adjective, 1-19; adverb, 1-21; conjunction, 2-481; noun, 5-468; proposition, 6-283; pronoun, 6-294; punctuation, 6-309; sentence, 6-531.

Grammar schools, 6-503.

Gram-molecule. In physics, 3-310.

Gramophone, 4-56; Edison's phonograph, 3-164; and popularity of music, 5-306.

Gramplains. Range of mts. in Scot., highest point is Ben Nevis, 4,406 ft.; several others over 4,000 ft., 6-510, -511.

Granada. City on shore of Lake Nicaragua, Nicaragua, Cent. Amer.; pop. 38,918; 5-430.

Granada. Spain. Cap. of prov. of Andalusia; pop. 153,256; 4-59, 7-104; Alhambra, 1-111; expulsion of the Moors, 7-105.

Gran Chaco. Vast expanse of grassland and forest in Argentina, Bolivia, and Paraguay; area 95,368 sq. m.; 6-76; Bolivia-Paraguay war, 1932-35, 1-507.

Grand Banks. Submarine plateau in the Atlantic Ocean, stretching for 200 m. off the coast of Newfoundland; fishing grounds, 3-378, 1-498.

Grand Canal, China (1280-83 A.D.), 850 m. long, 4-268.

Grand Canal. Principal thoroughfare of Venice, 7-388, 387 illus.

Grand Canary. Is. of the Canary Group; 640 sq. m.; cap. Las Palmas.

Grand Canyon. Arizona, U.S.A., 4-60, 61 illus. f., 1-238.

Grand Dauphin, The (1661-1711). Son of Louis XIV of Fr.; *Fables of La Fontaine* addressed to, 4-437.

Grand Falls, Labrador; potential water power, 4-428.

Grandfather clock, 2-415 with illus.; pendulum in, 6-115.

Grandi, Count Dino (b. 1895). Italian diplomat; member of the Fascist Grand Council; ambassador in London in 1932-3, then minister of Justice and Pres. of Chamber of Fascists and Corporations; acquitted Dec. 1947 of all charges of Fascist activity.

Grand jury, in law, 4-388; established by Henry II, 4-162.

Grand Monarch, The. Name given to Louis XIV of France, 5-42.

"Grand Mufti" (of Jerusalem). See **Hussein**, Haj Mohammed Emir el.

Grand National. Steeplechase held annually at Aintree, nr. Liverpool; water-jumps include famous Becher's Brook; 4-109, 108 illus., 4-525.

Grand Pré, Nova Scotia. Historic vil.; pop. 400; famous as scene of Longfellow's *Evangeline*.

Grand Prix (grah'v'p'ri) (Fr. "great prize.") Name given to many important sporting events, esp. the Fr. Grand Prix d'Endurance motor race.

Grand Rapids. Cap. of Michigan, U.S.A.; pop. 136,515; one of the world's greatest furniture-making centres; 5-192.

Grand Remonstrance. Protest against misgovernment presented to Charles I (1641) by Eng. House of Commons; the king's impeachment of and attempt to arrest the 5 leaders responsible for the Remonstrance were among causes of the Civil War.

Grand Union Canal. Canal system of Eng. Formed in 1929, it is a union of the Grand Junction, Regent's and other canals, extended in 1932, altogether 240 m. long, 2-205, 1-190.

Grania (grā'nīa) or **Grainne**. In Celt. myth, the Helen of the Fenian cycle of old Irish tales, beautiful young betrothed of the old Finn; desert him for Dermot, but finally wed him when Dermot is dead.

Granious (grā'n'k'us). Anc. name of small r. in N.W. Asia Minor where Alexander the Great won first victory over Persians, 334 B.C.

Granite. Rock, 4-60, 5-214 illus.

Granite Peak. Peak in Rocky Mts., 12,850 ft., 5-249.

Granny knot, how to tie, 4-421 illus.

Gran Sasso d'Italia (Great Rock of Italy). Mountain mass of the Apennines. Monte Corno is the highest peak.

Grant, Duncan (b. 1885). Brit. painter. Influenced by Cézanne and Van Gogh. Outstanding draughtsmanship, inventiveness in colour, and fine appreciation of beauty of pigment.

Grant, Ulysses S. (1822-85). Famous general of the Amer. Civil War; 18th pres. of U.S.A.; Lee's surrender to, 4-475, 474 illus.

Grantham, Cambs., England, 2-182.

Granthamster. Poem by Rupert Brooke, 2-93.

Grantham. Market tn. of Lincs., Eng.; pop. 23,495; 4-61, 4-512.

Grant Land, Arctic circ. 1-220.

Grantown-on-Spey. Tn. Morayshire, Scot.; pop. 1,541; 5-261.

Granville-Barker, Harley (1877-1946). Brit. dramatist and theatrical producer (*The Voyage Inheritance*; *Wade*; *Prefaces to Shakespeare*); and Shaw's plays, 7-19.

Grape aphid (*phylloxera*). An insect which attacks grape-vines.

Grape-Fruit. A citrus fruit, 4-61.

Grapes. The fruit of the vine, 4-61, 3-483 illus., 7-461; glucose content, 4-36. See **Wines**.

Grape-shot. An old type of artillery projectile filled with bullets; Napoleon's "whiff of grape-shot," 5-318.

Grape-sugar. See **Glucose**.

Graphite. A form of crystalline carbon. Mined as a soft, black mass (plumbago) or as a crystal. Chief deposits in Gt. Brit. are in Borrow-

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dale, Cumberland; 2-210; used in making "leads" of pencils, 5-113; as moderator in atomic chain-reaction, 1-301.

Graptolites. Extinct class of minute marine animals; remains found in early sedimentary rocks; in Ordovician period, 3-515.

Grassmoor. Lake in Westmorland, Eng.; 1 m. long, about 1 m. wide; noted for associations with Wordsworth, 4-439, 7-445, 7-477.

Grass, 4-63; in dairy farming, 3-26; Brit. grasses, 4-frontis; bamboo, 1-350.

"Grass, Sailor's" 1-104 illus. f.

Grasse (grās's), François J. P., Marquis de (1722-88). Fr. admiral, commanded Fr. fleet in operations before Yorktown in War of Amer. Independence; 1-139.

Grasse. Town of s. France; flowers grown for perfume, 6-123, 6-403.

Grasholm. Isl. off coast of Pembroke-shire, famous for its colony of gannets; a bird sanctuary since 1940; in 1947 purchased by the Royal Society for the Protection of Birds.

Grasshopper. An orthopterous insect, 4-64, 1-157 illus.; egg, 3-171 illus.; eye, 3-333 illus.; hearing organs, 4-264; and Tithonus legend, 1-310. See also **Locust**.

Grasshopper Warbler, Bird, 7-418; migration, 5-204 illus. f.

Grassl (grās'sl), Battista (1854-1925). An It. zoologist, studied especially life and habits of white ants and bees.

Grassmoor. Mt. in Lake dist., Eng., 2,791 ft., 4-438.

Grass snake, 4-65 with illus.

Grating, for producing spectra, 7-128.

Grattan, Henry (1746-1820). Irish patriot, orator, and statesman; opposed parliamentary union of Ireland with Gt. Brit.; in Brit. Parl. 1805 till death; strove for Catholic emancipation; conspicuous for probity of his character no less than for his ability.

Gravelot, Jean François. See **Blondin**, Charles.

Gravelines (grahv'lén), Fr. Fortified spt. on r. Aa, 10 m. s.w. of Dunkirk; fisheries, shipping, shipbuilding; here a French force was defeated by Eng. and Spanish, 1558.

Gravelotte, Fr. Vil. 7 m. w. of Metz; defeat (Aug. 18, 1870) of French under Bazaine by Prussians under Crown Prince Frederick, 3-158.

's Gravenhage. See **Hague**, The.

Graves, Alfred Percival (1846-1931). Irish poet; wrote *Father O'Flynn*.

Graves, Robert (b. 1895). Brit. author; books include *I, Claudius*; *The Golden Fleece*; *King Jesus*.

Graves (grahv'). Wine either white or red, of the Graves dist. of Gironde, Fr. Generally dry, light. In Gt. Brit. a Graves wine is always white.

Gravesend, Kent. Borough and port on Thames 22 m. s.e. of London; pop. 45,043; airport; paper-making; 4-398.

Gravimeter, gravity meter, 4-67.

Graving docks. See **Dry docks**.

Gravitation, 4-66; and centrifugal force, 2-294; force exerted by earth on moon, 5-257; Einstein's General Theory of Relativity, 6-381; Newton's theory, 4-66, 5-408; and pendulum, 6-115; and the sun, 7-189; and wave motion, 7-432.

Gravity. See **Gravitation**.

Gravity, centre of, in vehicle, 5-157, 159 illus.

Gravity, Specific. See **Specific Gravity**.

Gravity arch. In bridge-building, 2-68.

Gravity dam, type of dam, 3-29.

Gray, Asa (1810-88). Amer. botanist; co-operated with Darwin; professor of natural history, Harvard Univ.; prolific writer on botany and allied subjects; his most important work was his admirable *Manual of the Botany of the Northern United States*.

Gray, Elisha (1835-1901). Amer. electrician; perfected various telegraphic devices; and invention of the telephone, 7-240.

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Gray, Thomas (1716-71). Brit. poet, 4-67; travels with Horace Walpole, 7-116; "Ellegy in a Country Churchyard," 3-288.

Grayling. Fish of salmon family, but spawns in summer, its close season coinciding with that for coarse fish; caught on fly; prefers fast, clear streams, and found especially in w. and n. of England; seldom exceeds 2 lb. in weight; silvery gray in colour.

Grayling butterfly, 2-140 illus.

Gray's Spiny Stick-Insect, 4 265 illus.

Gratz [grah's], or **Gratz**. 2nd city of Austria; iron and steel manufs.; univ. and technical schools; interesting medieval buildings; pop. 220,000.

Graxiani [gratz'eh'nē], **Rodolfo** (1882-1955). It. soldier; prominent in conquest of Abyssinia, 1935-36; commanded It. forces invading Egypt, 1940; recalled after Brit. recaptured Tobruk, 1941; surrendered to Amer. troops Apr. 29, 1945; imprisoned, 1945-50.

Great Anteater, 1-170.

Great Auk or **garefowl** (*Alca impennis*), 1-309.

Great Australian Bight, rainfall, 1-316.

Great Barrier Reef. Off N.E. coast of Australia, longest coral reef in world, 1-314, 2-501, 505 illus. f.

Great Basin. Region in w. U.S.A., about 200,000 sq. m. between Sierra Nevada on w. and Wasatch Mts. on e.; arid, mountainous; numerous salt lakes including Great Salt Lake and Lake Utah.

Great Bear (Constellation). See **Ursa Major**.

Great Bear Lake. North-West Territories, Canada; area 11,200 sq. m.; frozen most of the year; minerals, 5-462; 2-106, 5-61.

Great Bed of Ware. Massive four-poster bed, 1-401.

Great Belt, Denmark. Strait between isla. of Fünen and Zealand, 1-357.

Great Bible. Ordored by Henry VIII in 1539 to be placed in all churches, 1-443.

Great Bird of Paradise (*Parulisea apoda*), 6-76.

Great Britain. Island comprising England, Wales, and Scotland, together with adjacent small isls., 4-68; physical geography, 2-85; folk lore, 3-338; common grasses, 4-63; Gulf Stream, 4-105; stone crosses, 2-535; snakes in, 7-75. See also **Britain**; **British Isles**; **England**; **Scotland**; **United Kingdom**; **Wales**.

Great Butterfly orchid, 5-529 illus.

Great-circle sailing, and navigation, 5-340.

Great Commoner, The. Nickname of William Pitt the elder. See **Chatham**, 1st Earl of.

Great Crested Grebe, bird, 4-70 with illus.

Great Dane. Dog, 3-102, 101 illus. f. See also **Dogs** (list).

Great Dividing Range, Victoria, Australia; reaches 6,509 ft. in Mt. Bogong, 7-396, 6-321; rainfall, 1-316.

Great Dod. Mt. in Lake dist., Eng., 2-807 ft., 4-436.

Great Dog (constellation). See **Canis Major**.

Great Eastern. Steamship designed by I. K. Brunel, 2-99; used in cable-laying, 2-154, 152 illus.

Greater eelcandine. See **under Celandine**.

Great Exhibition of 1851; Paxton and the Crystal Palace, 3-327; life boat plans, 4-493; Prince Consort and, 1-93.

Great Fall, in Yellowstone Park, U.S.A. 7-513 illus.

Great Falls, tn. in Montana, U.S.A.; pop. 29,006; 5-249.

Great Falls, on Missouri r., 5-227.

Great Fire. Name given to the fire that destroyed a great part of London in 1666; among the buildings that suffered destruction were St. Paul's Cath., the Guildhall, and the Royal Exchange; more than eighty churches razed; the Monument, 5-

20; and Sir Christopher Wren, 7 500.

Great Gable. Mt. in Lake dist., Eng., 2,950 ft., 4-438, 3-10 illus.

Great Harry, The. Tudor warship, 7-31 illus.

Greathead, James Henry (1844-96). A tunnelling shield named after him; helped to build world's first tube railway in 1896, 7-326.

Great Ice Barrier. See **Ross Ice Barrier**.

Great Kanawha river. See **Kanawha**.

Great Lakes. Chain of five fresh-water lakes situated between Canada and U.S.A.; Superior, Michigan, Huron, Erie and Ontario; area 94,710 sq. m.; 4-68, 2-196, 5-452. See individual lakes by name.

Great Laurel. Variety of laurel native to the U.S.A., 4-456.

Great Malvern (Worce). See **Malvern**.

Great Mogul. See **Akbar**.

Great Mogul. Large Indian diamond, originally 817 carats; 3 84, 82 illus.

Great Northern Diver. Bird; egg, 1-452 illus. f.

Great Orme's Head. Peninsula on the coast of Caernarvonshire, N. Wales.

Great Plague of London (1665). Outbreak of bubonic plague in London and surrounding dists.; carried by rat-borne fleas, 6-365.

Great Pond Snail, 5-232 illus. f.

Great Pyramid (at Gizeh). See **Pyramid**, The Great.

Great Rebellion, in Eng. (1612-49). See **Civil War** (England).

Great Rift Valley, Africa; Red Sea in, 6-375.

Great Russian language, 6 180, 6 473.

Great St. Bernard Pass. See **St. Bernard Pass**.

Great St. John's Wort. See **Rose of Sharon**.

Great Salt or Lut Desert. Northern Persia, 3-78.

Great Salt Lake. Lake in Utah, U.S.A., length about 70 m., width 20-50 m.; large quantities of salt are obtained by evaporation, 7 371, 4-438, 5-453, 5 196.

Great Schism [szizm]. Division in Rom. Cath. Church (1378-1417) between two factions, each of which supported its own Pope; 2 380.

Great Slave Lake. North-West Territories, Canada; river traffic, 5-61, 2-196; minerals, 5-462.

Great Snipe, bird, 7 76.

Great Star of Africa, among crown jewels, 2-frontis.

Great Tits. Birds, as insect destroyers, 1-151.

Great Tom. Bell at Christ Church Oxford; curfew, 1 426.

Great Train Robbery, The (1903). Pioneer Amer. film, 2 395; scene from, 2 397 illus.

Great Trek (1836), of the Boers, 1-51, 7-91.

Great Union flag. See **Union Jack**.

Great Wall of China, 2-368, 362 illus.

Great Western. First steamship built for Atlantic crossing (1837). Built at Bristol, 2-73, 7 37 illus.

Great Western Railway. Former rly. co. of the U.K.; and 7-foot gauge, 2-99, 6-356.

Great Wharfedale. Mt. in Yorks, Eng., 2,310 ft., 6-118.

Greaves. In arm ur, 1-213, 244.

Grebe. Bird, 4-69; foot of, 1 471 illus.

Greco, El (1541-1614). Greek (Spanish) painter, 4-70, 7-112; Burial of Count Orgaz, 7-116 illus.

Greece. Ancient, 4-71; and anc. Aegean civilization, 1-24, 25; architecture, 1-209; astronomy, 1-278, 2-489; Athens, 1-287; athletics, 1-290; calendar, 2-174; civil service, 2-105; coins, 5-235 illus.; costume, 2-420; democracy in city states, 3-70; food and colonial expansion, 3-408; foot measure, 3-414; mass-produced lamps, 4-442; laundries in, 4-454; marriage customs, 5-134; study of medicine, 5-161; Olympic Games, 5-508, 510 illus.; oracle at Delphi, 3-69; philosophers, 6-160; Sparta, 7-123; Thebes, 7-266; writing tablet, 2-1 illus.

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Greece, Modern. Kingdom of Europe; area 51,168 sq. m. (incl. islands); pop. 7,060,000; cap. Athens, 4-71, 4-79; flag, 3-384 illus. f.; national character, 4-80; agriculture, 4-79; minerals, 4-80; Athens, 1-288; independence gained from Turkey, 7-335; pop. exchange with Turkey, 1-350; Gk. Macedonia, 5-63; and World Wars, 7-483, 489 100, 5-311.

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Greek cross, 2-535.

Greek Language and Literature, 4 92; alphabet, 1-120, 6 161; and English vocabulary, 3 282; hexameter, 6-234; influence on Latin, 4 449; and revival of learning, 6-384, 386; drama, 3-115, 7-263; and mythology, 5-312; Sophocles, 7 85. See also chief Gk. authors.

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Greek Orthodox Church, 6 426, 2 17.

Greely, Horace (1811-72). Amer. journalist and politician; founder and first editor of *New York Tribune*.

Greely, Adolphus Washington (1811-1935). Amer. explorer. Originally a soldier, he served many years in the Arctic and was a pioneer in laying telegraph lines in America and the East. Wrote on meteorology, electricity, geography.

Green, Charles (1785-1870). Brit. balloonist, 1-351.

Green, John Richard (1837-83). Brit. historian. Famous for *History of the English People* (short and long editions); he also wrote *The Making of England*, *The Conquest of England*, and *Stray Studies from England and Italy*; 3-291.

Green, Thomas Hill (1836-82). Brit. philosopher; chief Brit. representative of so-called Neo-Hegelian school of philosophy; maintained the existence of a timeless intelligence as the essential principle of all knowing beings; though never popular, wielded wide influence over other philosophers; 6-160.

Green, Valentine (1739-1813). Brit. engraver, who became famous for his mezzotints after the Brit. and foreign masters.

Green, pigments, 6-38; in signals, 7-52.

Greenaway, Kate (1846-1901). Brit. artist, famous for quaint drawings of children, characterised by skilful colouring and charming costumes.

Greenbacks. U.S. currency notes of Civil War period, so called because back was printed in green.

Green Belt. A belt of open space round London on which building is forbidden, though agriculture is carried on.

Greenbriar. See **Smilax**.

Greene, Graham (b. 1904). Brit. writer. Novels include *Brighton Rock*, *The Power and the Glory*; film scripts, *The Fallen Idol*, *The Third Man*; plus *The Living Room*.

Greene, Nathanael (1742-86). Amer. gen. of the War of Independence. His

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was in command of the Army of the South; his successful campaign gained for him the name of "the man who saved the South."

Greene, Robert (c. 1560-92). Eng. dramatist and poet, remembered for a few charming lyrics and a derivative reference to Shakespeare in his *Imitation of Will Bought with a Million of R-p-nance*, 7-12; 1-341. 3-118, 3-285.

Greenfinch. Bird native to Gt. Brit., 3-352.

Green fly. An aphid, 1-183, 182 illus.

Greengage, fruit of the plum family; origin of name, 6-228.

Green Hairstreak butterfly, 2-139 illus.

Greenhouse, and gardenia, 3-503.

Green Howards. Infantry regiment of Brit. army. Raised 1688 as the 19th Foot. Called Yorkshire Regiment, 1881, received present title, originally a nickname, in 1920. Title derived from first commanding officer, Sir Charles Howard, who introduced green facings for the uniform.

Green Knight, The, and Sir Gawain in Arthurian legend, 1-256, 6-457.

Greenland. Island in Arctic, a province of Denmark; area 830,000 sq. m.; pop. 24,000; 4-94, 4-220; discovery and exploration, 6-242, 5-316; as part of Denmark, 3-75; in 2nd World War, 1-221.

Greenland Seal; declining numbers, 6-325.

Greenland Shark, 7-18 illus.

Green Lizard, 4-530, 6-388 illus.

Green Monkey, 5-241.

Green Mts. Range of Appalachian system, U.S.A., extending through Vermont; highest peak, Mt. Mansfield (4,361 ft.); marble and granite are quarried, 7-392.

Greenock. Shipbuilding centre and sp. of Renfrewshire, Scot.; pop. 76,299, 6-358.

Green Park, London, between Piccadilly and the Mall; area 54 acres.

Greensand. A clay of sand coloured green by glauconite.

Greensand marl. A marl containing greensand; used as fertiliser.

Greenshank. Wading bird of the snipe family, native to N. Europe. Summer visitor to N. Scotland. Length 14 in. Legs long, pale olive-green (hence name). Frequent coastal marshland, estuaries, and reservoirs.

Greenstone. See *Diabase*.

Green Tiger beetle, jaws, 4-266 illus.

Green-veined White, butterfly, 2-139 illus.

Green vitriol (ferrous sulphate, copperas), 7-187.

Greenwich [grin'ij]. Met. bor. of

London on Thames; pop. 81,492; Naval Hospital and College; famous Royal Observatory; National Maritime Museum; 5-27; park, 5-28; longitude 0°, 4-452 illus.

Greenwich Mean Time, 7-227; ships' chronometers set by, 5-491, 4-453; fixing longitude, 2-383.

Greenwich Village. Dist. of New York inhabited by artists, writers and students, 5-415.

Greenwood, Arthur (1880-1951). British politician, Labour M.P. from 1922; par. sec. to ministry of health, 1924; minister of health, 1929-31; minister without portfolio, 1940-42, presiding over economic policy committee; lord privy seal, 1945-47; minister without portfolio, 1947. (Created C.B., 1945.)

Greenwood, Frederick (1830-1909). Brit. journalist; first editor of *Pall Mall Gazette* and founder of the *St. James's Gazette*; on his information the Brit. govt. purchased Suez Canal shares.

Green Woodpecker, foot, 1-471 illus.

Greet, Sir Philip Ben (1857-1936). Brit. actor and manager, known as Ben Greet; presented Shakespeare's plays as they were done in Elizabethan times.

Greet shorthand, compared with Pitman system, 7-43.

Gregor, Rev. William (1761-1817). Brit. chemist, discovered element, titanium in 1791, 7-282.

Gregorian calendar, or New Style calendar; adopted in Gt. Brit. (1752), 2-175; and New Year's Day, 5-409.

Gregorian chant, in church music, 5-303, 4-95.

Gregory (of Nazianzus) St. (c. 330-390). Churchman whose writings contain best statement of doctrine of Trinity in Gk. orthodox theology.

Gregory (of Nyssa), St. (c. 331-c. 396). Gk. churchman who anticipated doctrine of transubstantiation; a constructive thinker.

Gregory, popes. For complete list see *Pope*.

Gregory I, The Great (c. 540-604). Pope, 590-604, 4-95; and church music, 5-303; and Papal power in Italy, 4-306.

Gregory VI (d. 1047). Pope, deposed in 1046.

Gregory VII, Hildebrand (c. 1025-1085). Pope, 1073-85, 4-95; struggle with Henry IV, Holy Rom. emperor, 4-7, 4-308.

Gregory XIII (1502-85). Pope, 1572-85; reformed the calendar, 2-17.

Gregory, Augusta, Lady (1859-1932).

GRETA

Irish dramatist and romance writer, associated with Yeats in Irish literary revival (*Gods and Fighting Men*; *Spreading the News*); portrait, 4-287 illus.

Gregory, John Walter (1864-1932). British geologist. Author of *The Great Rift Valley*; *The Rift Valleys of East Africa*; drowned while exploring in S. America.

Gregory, Sir Richard A. (1864-1952). Brit. scientist; editor of *Nature*, 1919-39; pres. of Brit. Assn., 1940-46; *The Vault of Heaven*.

Gregory of Tours. Fr. historian, 4-181.

Gremial. Silk apron laid on the lap of a bishop; originally intended to protect vestments from oil.

Grenade (grenād'). An explosive missile, usually thrown by hand.

Grenadier (grenādér'). Name once given to soldier who threw hand-grenades; later each regiment had company of grenadiers; name survives only in Grenadier Guards.

Grenadines. Group of about 600 small isls. in Brit. W. Indies.

Grendel. Water-monster in Beowulf story, 1-131.

Grenelle, Paris; artesian well at, 1-255.

Grenfell, Julian Henry Francis (1888-1915). British soldier and poet (*Into Battle*); won D.S.O. in 1st World War; died of wounds.

Grenfell, Sir Wilfred Thomason (1865-1910). Brit. doctor and missionary, 4-96, 4-425.

Grenoble (grenō'bl), Fr. Fortified city on r. Isère 60 m. s.e. of Lyons; pop. 102,000; univ.; kid gloves.

Grenville, George (1712-70). Brit. statesman; prime minister (1763); secured passage of Amer. Stamp Act, one of the causes of War of Amer. Independence.

Grenville, Sir Richard (c. 1511-91). Eng. seaman and naval hero, 4-96.

Grenville, William Wyndham, Baron (1759-1834). Brit. statesman, son of George Grenville; as premier (1807) secured abolition of Brit. slave trade; advocated Cath. emancipation.

Gresham, Sir Thomas (c. 1519-79). Eng. merchant and financial agent of the govt.; founder of Royal Exchange and Gresham's College; formulator of "Gresham's law"—"bad" money tends to drive "good" from circulation.

Greta, r. of Cumberland, Eng., 4 m. long. Joins r. Derwent at Keswick. Another Greta is a tributary of the Tees, a third rises nr. Ingleton and joins the Lune; both in Yorks.

GREAT NAMES IN ANCIENT GREEK LITERATURE

Aeschylus (525-450 B.C.), dramatist and tragic poet—"The Seven Against Thebes"; "Agamemnon"; "Choephoroi"; "Eumenides."

Alcæus (flourished 611 B.C.), lyric poet—Fragments. Gave his name to the Alcæic stanza.

Alcman (flourished 615 B.C.), Spartan poet—"Parthenion."

Anacreon (750 B.C.), lyric poet—Fragments.

Anaxagoras (500-428 B.C.), philosopher—Fragments.

Anaximander (610-547 B.C.), Ionian philosopher—Fragments.

Antisthenes (flourished 426 B.C.), philosopher. Founded the Cynic sect.

Aristophanes (444-380 B.C.), comic poet—"The Knights"; "The Clouds"; "The Wasps."

Aristotle (384-322 B.C.), philosopher—"Physics"; "Metaphysics"; "Nicomachean Ethics"; "History of Animals."

Arrian (A.D. 90-170), historian—"History of the Expedition of Alexander the Great."

Athenaeus (flourished A.D. 230), essayist and grammarian—"Deipnosophistae" (Doctors at Dinner).

Boeotylides (flourished 470 B.C.), lyric poet—"Odes."

Callimachus (third century B.C.), poet and grammarian—"Ritual Origins"; "Epigrams."

Demosthenes (384-322 B.C.), orator—"On the Crown"; "Private Orations."

Diogenes (412-323 B.C.), cynic philosopher—Fragments.

Diogenes Laërtius (second century A.D.), biographer—"Lives of the Philosophers."

Epicetus (first century A.D.), Stoic philosopher—"Enchiridion."

Epicurus (342-270 B.C.), philosopher—Fragments.

Euclid (323-283 B.C.), mathematician—"The Elements."

Euripides (480-406 B.C.), tragic poet and dramatist—"Alceste"; "Medea"; "Orestes"; "Electra."

Heraclitus (flourished 513 B.C.), philosopher—Fragments.

Herodotus (b. 484 B.C.), historian—"The History."

Hesiod (eighth century B.C.), poet—"Works and Days"; "Theogony."

Homer (ninth century B.C.), epic poet—"Iliad"; "Odyssey."

Plato (429-347 B.C.), philosopher—"Socratic Dialogues"; "Republic."

Plutarch (A.D. 46-120), essayist and biographer—"Moralia"; "Parallel Lives of Illustrious Greeks and Romans."

Polybius (second century B.C.), historian—"The History."

Pyrrho (flourished 304 B.C.), philosopher—collected works of the Sceptic School by Sextus Empiricus.

Pythagoras (b. 582 B.C.), philosopher and mathematician—"Golden Verses."

Socrates (469-399 B.C.), philosopher—"Teachings in Plato."

Strabo (first century B.C.), geographer—"The Geography."

Thales (636-546 B.C.), first great Greek philosopher—fragments in the works of other writers.

Thucydides (471-401 B.C.), historian—"The History."

Xenophon (fifth century B.C.), essayist and historian—"Anabasis"; "Cyropaedia"; "Hellenica."

Zeno (fifth century B.C.), philosopher—"The Flying Arrow"; "The Stadium"; "Achilles and the Tortoise."

GREYNA GREEN

Gretna Green, Scot. Village in Dumfries-shire near Eng. border; once scene of runaway marriages from Eng.; smithy, 6-135 illus.

Gréville (gré), Jean Baptiste (1723-1805). Fr. genre and portrait painter, whose work in painting, like Rousseau's in literature, represents a sentimental return to Nature.

Gréville, Charles Cavendish Fulke (1791-1865). Brit. public official and diarist whose journals (published 1875-87) contain much valuable historical material for first half of the 19th cent.

Grey (grēv), Jules (1807-91). Fr. statesman, pres. of Fr. Assembly (1871-8), pres. of Chamber of Deputies (1876-9); pres. of Fr. Republic (1879-87); resigned owing to scandal involving his son-in-law in traffic in offices and decorations.

Grey, Charles Grey, 2nd Earl (1764-1845). Brit. statesman, prime minister in the Whig govt., responsible for the Reform Act of 1832. Resigned 1834.

Grey of Fallodon, Edward, 1st Viscount (1862-1933). Brit. statesman. (Liberal); as Sir Edward Grey (baronet 1882) was foreign sec. 1905-16 (resigned); created viscount 1916; books on fly-fishing and birds.

Grey, Lady Jane (1537-54). Wife of Lord Guildford Dudley and nine days' queen of England, 4-97, 2-353, 8-140.

Grey, Zane (1875-1939). Amer. novelist; *Desert Gold*, *Riders of the Purple Sage*, *Man of the Far West*, and other tales of adventure in the Far West.

Grey Friars. See Franciscans.

Greyhound. Dog. 3-102, 101 illus. f. See also Dogs (table).

Grey kangaroo, 4-391.

Grey lag goose, nesting habits, 4-16, 47 illus.

Grey Monks. See Cisterciens.

Grey parrot, 6-92 with illus.

Grey plover. Bird, 6-227.

Grey seal, 8-525.

Grey shrike. Bird, autumn and winter visitor to Brit., 7-14.

Grey slug, 7-74 illus.

Grey squirrel, a pest, 7-140.

Grey wolf, or Buffalo wolf, 1-470.

Griboedov (grībōd'of), Alexander (1795-1829). Russ. dramatic poet and statesman; sent as minister to Persia, where he was killed by a mob; famous for one comedy, *Misfortune from Intelligence*, a satirical drama showing Rus. manners and social struggle between older and younger generation.

Grid. An electrode in an electronic valve whose primary function is to control the flow of current between two other electrodes. In a triode, the grid is the electrode between the cathode and anode; and is usually a mesh or grid of wires; 8-222, 7-337 with illus.

. Also the national system of elect. power transmission used in Gt. Brit., 3-210, 218. In surveying, the horizontal angle between any given survey line shown on a map and the right- or left-hand border of the map, 8-119, 120 illus. f.

Grieg, Edvard Hagerup (1813-1907). Norwegian composer, 4-98, 5-407; and Dellus, 3-88.

Griffin, Walter Burley. Amer. architect; designed Canberra, Australia, 2-209.

Griffin. A mythical creature, half eagle, half lion, supposed to guard hidden treasure.

Griffin. Heraldic animal, 4-104 illus. f.

Griffin, Arthur (1872-1922). Irish statesman; organiser of Sinn Féin; signatory of the Anglo-Irish treaty (1921) and first president of Irish Free State.

Griffith, David Wark (1860-1948). Amer. pioneer film director, 2-396.

Griffiths, James (b. 1890). Brit. politician; pres. S. Wales Miners' Federation and member exec. cttee. Miners' Federation (1934-36); min. of nat. insurance (1945-50); sec. for colonies (1950-51).

Griffon, Miniature. Dog. 3-101. See also Dogs (table).

Grillage. See Architectural terms.

Grille. See Architectural terms.

Grilling. In cookery, 2-488.

Grillparzer (gril'par'tser), Franz (1791-1872). Austrian dramatic poet, 4-13.

Grille. A young salmon, 6-490.

Grimaldi, Joseph (1779-1837). Famous Brit. clown; Charles Dickens edited his *Memoirs*; and harlequinade, 4-133.

Grimaldi, name given to supposed prehistoric race of Man represented by skeletons in grotto near Mentone.

Grimm, Jakob Ludwig Karl (1785-1863) and Wilhelm Karl (1786-1859). German scholars, collectors of folk-tales, 4-98, 3-405, 2-354; language studies, 6-158, 4-445.

Grimm's Law. In linguistics, 4-98, 6-158.

Grimsby. Fishing port of Lines, Eng., pop. 91,527; shipbuilding works; 4-512.

Grindelwald (grin'delval't). Swiss valley and tn. (pop. 3,000) overlooked by Wetterhorn and other lofty peaks.

Griqualand (grī'kwaland) East. A native territory of Cape of Good Hope prov.; 6,002 sq. m.; pop. 1,118,000.

Griqualand West, S. Africa. Dist. of the Cape of Good Hope, to which it was joined in 1877; it contains some of the most valuable diamond mines in the world, including Kimberley; pop. 85,000.

Gris (grī), Giulia (1811-69). Ital. dramatic soprano, greatest of her day. Her younger sister Carlotta was a ballet dancer who created the rôle of Giselle, 1-351.

Gris Nez (grī'nē), ("grey nose"), Cape. Headland of Fr.; point of Fr. coast nearest to that of Britain.

Grisons (grī'zon). Easternmost and largest canton of Switzerland; 2,740 sq. m.; pop. 128,200; noted for superb Alpine scenery, especially in the Engadine; 7-212, 211 illus. f.

Grizzled Skipper butterfly, 2-110 illus.

Grizzly bear, 1-392.

Groat. A medieval Eng. silver coin, value fourpence.

Groats, out kernels, 5-190.

Grocers' Company, 4-526.

Grook. Stage name of Charles Adrien Wettach (b. 1880), a Swiss clown of international reputation.

Grodno or Gardinas. City of White Russia. Formerly Lithuanian, then occupied by Poland; on r. Niemien; pop. 30,000; old buildings, varied mfrs.; trade in grain and timber; ceded to U.S.S.R. in 1945.

Grolier, Jean, Vicomte d'Aguisay (1479-1565). Fr. book collector; Grolier binding, 2-9 illus.

Gromyko (grōm'ko), Andrei (b. 1909). Russ. diplomat; ambas. to U.S.A., 1913; represented Russ. at Dumbarton Oaks and San Francisco Conferences, and at U.N. meeting in London, 1946, becoming perm. mem. of Security Council; first deputy foreign min., 1949-52; ambassador to Gt. Brit., 1952-53.

Groningen (grō'ningē). Spt. and cap. of Groningen prov., Netherlands; pop. 136,556; numerous canals; large trade, mfrs., shipbuilding; 5-370.

Groote Schuur. Residence of South African prime minister, near Cape Town, bequeathed by Cecil Rhodes, 2-218.

Gropius, Walter (b. 1883). German architect. Founded school of design named Staatliches Bauhaus, uniting art and industry; 1-218.

Gros (grō), Antoine Jean, Baron (1771-1835). Fr. painter of military pictures, chiefly Napoleonic; pupil of Jacques Louis David.

Groschen. See Money (table).

Groselliers (grō'syār'), Menard Chouart, Sieur de (1621-c. 1684), intrepid Fr. explorer and fur trader, brother-in-law of his companion Radisson; 5-222.

Gros Michel. Variety of banana, 1-359.

Grossmith, George (1847-1912). Brit. actor and entertainer, who came into prominence in 1877 when playing in Gilbert and Sullivan operas; his

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humorous recitals were very popular in both Gt. Brit. and Amer.

Grossmünster. 11th-13th century church in Zürich, Switzerland, 7-528 illus.

Gross tonnage, of ships; how it is reckoned, 7-32.

Groszy. See Money (table).

Grote, George (1794-1871). Brit. historian and banker; his *History of Greece* is "one of the few great comprehensive histories."

Grotewohl, Otto (b. 1894). Became premier of E. German Repub. in Oct. 1949.

Grothius, Hugo (Lat. form of van Groot) (1583-1645). Dutch statesman and jurist; treatises on law, 4-459.

Grouchy, Emmanuel, Marquis de (1766-1847). Fr. marshal, to whose delay at Waterloo Napoleon attributed his defeat, 7-429.

Ground duties, in R.A.F.; careers in, 6-162.

Groundhog. See Woodchuck.

Ground Ivy, *Nepeta hederacea*. A trailing herb, with two-lipped, bluish-purple flowers; a perennial of the order Labiales; not related to Ivy.

Ground mines, 5-221.

Groundnuts, 4-98; oil in margarine, 5-124.

Groundsel, *Senecio vulgaris*. Plant of order Compositae; a common garden weed, with small heads of tubeflorets; flowers all year round; used as canary food.

Groundwood pulp, in paper-making, 6-84.

Group Captain, in R.A.F., 6-463.

Group Movement. Religious movement, sometimes called Oxford Group, founded by American, Frank Buchman, in 1921; chief feature, "sharing" of spiritual experiences by public confession. Renamed Moral Re-Armament, 1939.

Grouse. Bird, 4-99; nesting habits, 1-455; shooting season in Scot., 6-510.

Grover, William O. (19th cent.). Amer. inventor of a sewing machine, 7-10.

Growth, animal, 1-514.

Grozny. Tn. of U.S.S.R. N. of Caucasus Mts., on Rostov-Baku rd., rich oil and naphtha area.

Grubs, the larvae of beetles, 4-118.

Grub Street. Name of a former street in London, where lived many poor literary men, hence the phrase "Grub Street authors."

Gruenther, Alfred M. (b. 1899). U.S. soldier; chief of staff, Italy 1942-44; chief of staff, S.I.A.P.E. 1951-53; supreme allied commander, Europe, 1953-56.

Grundy, Mrs. The personification of society's judgments, generally "prudish"; name originated in old play, *Speed the Plough*, where a character asks continually, "What will Mrs. Grundy say?"

Gruyère (grüyär'), Switzerland. Pic-turesque tn. perched on a high hill 16 m. s. of Fribourg; pop. 2,000 famous for its cheeses; 2-315.

Guadalajara (gwah'dalahah'ia). Sec. and city of Mexico, and cap. of Jalisco; pop. 337,000; centre of Mex. steel and glass industries. Indian pottery; silver mining and farming region; severe earthquake in 1875 and 1912; city founded in 1531; 5-186.

Guadalajara. City of Sp., 35 m. from Madrid on main rly.; pop. 14,000. Woollens, soap and bricks are made.

Guadalupe (gwah'dalah'pahr') (Alo-bio "white river"). A river in Sp. 150 m. long; its waters irrigate fertile plain around Valencia and give city most of its water supply; 7-374 illus.

Guadalupe (gwah'dalah'pahr'). Largest isl. (area est. 2,500 sq. m.) of Australian trusteeship terr. of the Solomon Is. s.w. Pacific; h.q. of a resident com-missioner; in 2nd World War occupied by Japanese Aug. 1942-Feb. 1943, 7-494 with illus.

Guadalquivir (gwaddal'kiver') (Arabic "great river"), river in Sp., 350 m long; rises in E. of prov. of Jaen

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flows s.w. through Seville and Cordoba into Atlantic, 20 m. n. of Cadiz; 7-6.

Guadeloupe [gwahdleh'op]. Inhabited isl. in Pacific Ocean, 75 m. off coast of U.S.A.

Guadeloupe. Dept. of France in Fr. West Indies; area 688 sq. m.; pop. 278,864; 4-100.

Guadiana [gwahdesh'na]. One of the longest (520 m.) of the five great Span. rivers, but narrow and poor in volume; flows into Gulf of Cadiz; 6-267.

Guallieri, Giovanni. See Cimabue.

Guam [gwahm]. U.S. isl. in Pacific, at s. extremity of Mariana archipelago; 225 sq. m.; pop. 23,000; naval station; Japan occupied, 1941-44; administered by U.S. Navy, but in 1946 civil commission recommended grant of citizen rights of U.S.; discovered by Magellan, 5-77.

Guano. S. Amer. animal of the camel family, 4 530, 1-119.

Guanaquato or Santa Fé de Guanaquato. Historic city of Mexico; pop. 10,000; gold and silver mining; first battle in Mex. war of independence fought there in 1810; 5-187.

Guanches [gwahnohez]. Hamitic people, natives of Canary Isls.; originally tall, blond, athletic, but later mixture with Arabs changed these characteristics; by language allied to anc. Numidians.

Guano [gwah'no]. A fertilizer obtained from massed droppings of seabirds in their breeding haunts, certain islands off the coast of S. Amer.; from peruvian colony; 115.

Guantanamo [gwahntahnah'mo]. Cuba. Tn. on r. Guano near head of fine harbour on S. coast; pop. 68,000.

Guarani. See Money (table).

Guaraní [gwahrah'né]. Native Indians of Paraguay; their descendants also form bulk of population of Uruguay, and are important element in Bolivia and Brazil, 6-76.

Guardafui [gwahrdahfwé]. Cape. Extreme eastern point of Africa; promontory of Somaliland at entrance to Gulf of Aden.

Guardi, Francesco (1712-93). Italian painter; 4-319; Scene on the Lagoon, 4-325 illus.

Guards. The Queen's guards are divided into two groups: (1) Personal bodyguard, comprising Honourable Corps of Gentlemen-at-Arms; Yeomen of the Guard and Royal Company of Archers (Scottish). (2) Regiments from the active army, comprising Household Cavalry and Foot Guards. The former are made up of the Life Guards and Royal Horse Guards; the latter of the Grenadier, Coldstream, Scots, Welsh, and Irish Guards; side drum, 3-128 illus.; Trooping the Colour, 2-466 with illus.

Guards Armoured Division. The, at Ainhem battle (1944), 1-254.

Guarini [gwahré'né]. Giambattista (1537-1612). It. poet; wrote *Il Pastor Fido*; like Tasso's *Aminia*, on which it is patterned, it is a lyric conception of the ideal life; identifies happiness with simple rustic life.

Guarnieri [gwahné'ri]. Guarnieri, or Guarnierius, celebrated family of It. violin-makers of 17th and 18th cents., of whom most celebrated was Giuseppe Antonio (1687-1745); 7-402.

Guatemala. State of Cent. Amer.; area 45,450 sq. m.; pop. 2,787,030; 4-101, 2-292, 293; flag, 3-383 illus. f.

Guatemala. Tn. and cap. of Guatemala state, pop. 293,998; 4-101.

Guava, type of fruit, 3-470.

Guaviare [gwahväh'rä]. River of Venezuela; rises in Andes, flows n. 700 m.

Guayaquil [gwahkäl']. Only spt. of Ecuador, S. Amer., on estuary of the Guayas, at head of the Gulf of Guayaquil; pop. 250,000; 3-161.

Guayaquil. Gulf of, large inlet of Pacific in Ecuador; over 100 m. wide at its mouth; narrows into estuary of r. Guayas.

Guaymas, spt. on w. coast of Mexico; pop. 8,796; 8-186.

Guayule [gwüülä] shrub, of the family *Compositae*; yields rubber.

Guderian, Heinz (1888-1954). Ger. soldier, born in Poland; staff officer in 1st World War; formed Panzer divisions victorious in Poland, France, and Flanders, 1939-40; replaced Jodl as chief of gen. staff, 1944; supreme command. Rus. fronts; captured by Allies May 1945; for 2 yrs. helped compile Ger. history of the war for U.S.A.

Gudgeon. Fish of carp family, distinguished by small size and by two "barbels" below mouth; feeds on bottom in shallow, gravelly water; caught in large numbers, gudgeon are good to eat; 6-401.

Gudrun [good'roon]. A Low German epic saga, taking the place of the Nibelungenlied in High German; Gudrun, the heroine, is kidnapped by an admirer, but after being held prisoner for 14 years is rescued by her brother and Herwig, her true lover; 4-13.

Guedalla, [gwedal'al], Philip (1889-1944). Brit. historian. Publications include *The Second Empire*; *Palmerston*; *Conquistador*; *The Hundred Years*; *The Duke* (biography of Wellington).

Guelder-rose, small tree, *Viburnum opulus*, common in damp places in Britain; bears flat clusters of white flowers, the outer ones in each cluster being large, consisting of perianth only and used to attract insects which fertilise the inner ones; red berries in autumn; leaves lobed. Variety of this is the snowball tree of cottage gardens. *V. lantana* is the wayfaring tree, common in hedges on limestone soils; leaves entire, mealy above and below, flowers in rounded clusters, berries flattened, white, then red, finally black; poisonous berries, 6-236.

Guelfs and Ghibellines, political factions of medieval It. and Ger. (where they were called *Welfen* and *Waiblingen*, the latter being the Hohenstaufens); 3-393, 4-313.

Guemal, type of S. Amer. deer, 3-60.

Guenon, African monkey, 5-211.

Guerino (1591-1666). It. painter of the Bologna school, 4-320.

Guericke, Otto von (1602-86). Ger. scientist; barometer 6-305; and electricity, 3-210.

Guérin (Géran), Eugénie de (1805-48) Fr. writer; sister of Maurice, to whom she was devoted; *Journals* and *Letters*, imbued with religious mysticism.

Guérin, Georges Maurice de (1810-39). Fr. poet and prose writer; wrote *The Centaur*, prose poem of strange mystic beauty; all his work characterized by passion for Nature; *Reliquiae*, his collected poems.

Guernica [gwér'nika]. Town of Vizcaya, Spain, 17 m. E.N.E. of Bilbao. At one time capital and "holy city" of the Basque people. Aircraft of Franco's army dropped 4,000 bombs on this undefended tn. on April 17 1937, in Sp. civil war, killing hundreds of civilians; tn. restored by 1946.

Guernier or **Werner**. Forecary captain of 14th cent.; ravaged Tuscany and Lombardy; when dismissed by Louis I, king of Hungary and Poland, sacked Anagni in 1358.

Guernsey [gérnz]. 2nd in size of Channel Isls.; 25 sq. m.; pop. 43,596; dependencies include Sark, Herm, and Jethou; St. Peter Port and St. Sampson chief towns; 2-302; bonnets, 4-136.

Guernsey castle, 2-274, 275 illus.

Guerrero [gerár'ó]. Mexico. State in s. on Pacific; 24,000 sq. m.; pop. 732,900; cap. Chilpancingo; agricultural and undeveloped mineral resources.

Guesclin, Bertrand du (c. 1320-80). French commander, defeated by Black Prince (1367), 2-398, 1-480.

Guiana. A region n.e. of S. Amer., com-

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prising Brit. Guiana, Surinam (Dutch Guiana) and Fr. Guiana, 4-101.

Guided Missiles, 4-103; rockets, 6-121.

Guido of Arezzo (c. 985-1050). Benedictine monk; influence on music, 5-303.

Guilbert (Gölibar), Yvette (1869-1944). A Parisian singer unsurpassed in her day for dramatic and humorous performance in old ballads.

Guilder. Monetary unit of Netherlands. See Money table.

Guildford. Tn. of Surrey, Eng.; pop. 47,484; cathedral, 7-196, 2 264.

Guildhall. Old council hall near Cheapside, London, several times rebuilt; in Great Hall are two giant wooden figures of Gog and Magog (destroyed Dec. 29, 1940, now effigies, 1953); other features the crypt, the Common Council Chamber, and Aldermen's Rooms; also Free Library, Museum and Art Gallery; Lord Mayor's banquet, 4-104 illus., 5-20.

Guilds. Medieval organizations for protection of trade and industry, 4-103; livery companies, 4-526; mystery plays, 3 118; schools, 6-303.

Guid Socialism. Movement led by G. D. H. Cole in decade of 1st World War, aiming at control of industry by "guilds" of people employed therein; similar idea in Fascist "Corporations."

Guillaume (gý'm'), Charles Édouard (1801-1938). Swiss physicist, compounded invar; 1920 Nobel prize winner in physics.

Guillemot (gil'emot). A bird of the auk family; common species is dark above, whitish below, black guillemot almost entirely black; 1-308; egg, 3-171 diag.

Guillotine. Beheading machine; in Fr. Rev. 3-469.

Guillotine, in book-binding, 2 8.

Guinea. Portuguese overseas province on w. coast of Africa; includes adjacent Bilagoz Isls.; area 13,948 sq. m.; pop. 517,240; chief tn. Bissau; 6 208.

Guinea. A former Eng. gold coin so named because gold of which it was coined originally came from Guinea Coast; first minted in 1664, recalled in 1776; term still used as money unit (21 shillings).

Guinea-fowl. Bird, member of pheasant family, 4-104, 1-66 illus. f.

Guinea-pig, 4-105 with illus.

Guineas, The. Two horse-races run at first spring meeting, Newmarket: the One and Two Thousand Guineas, 4-198.

Guinevere. Wife of King Arthur in medieval legends; and Lancelot, 6-458, 1-256.

Guinness (gin'is). Famous family of Irish brewers; brewery at Dublin founded by Arthur Guinness in 1759; Edward (Earl Guinness) (1847-1927) was created Earl of Iveagh in 1919.

Guipura lace, 4-433, 431, 432 illus.

Guiscard, Robert. See Robert Guiscard.

Guise (géz). Fr. ducal family, branch of house of Lorraine, whose heads led extreme Cath. party and aspired to snatch crown from house of Bourbon. Title became extinct in 1688.

Guise, Henry, Duke of (1550-88). "Le Balafre" (the Scarred); incited murder of Coligny and Massacre of St. Bartholomew; assassinated by order of Henry III of Fr.

Guitar (gitahr'). A stringed musical instrument resembling the lute, much in use in It. and Sp.; its six strings are played by the fingers of the right hand, the left-hand fingers pressing on the finger-board to control the pitch; 5-309.

Guitry (gýt're), Lucien Germain (1860-1925). Fr. actor, considered the greatest Fr. interpreter of modern realistic drama.

Guitry, Sacha (b. 1885). Fr. actor and playwright. Wrote over 100 plays—most of them witty, sophisticated comedies. Directed and acted in films.

Guizot (gý'zót), François (1787-1874). Fr. statesman and historian; head

GUJARAT

of ministry under Louis Philippe, 5-41.
Gujarat [gool'raht]. Town of Punjab, Pakistan; here British defeated Sikhs, 1849. Another Gujarat is a region of Bombay state, India.
Gulden or Guilder. See **Money** (table).
Gules. One of the seven heraldic tinctures; red.
Gulf Stream, 4-105, 5-498; influence on fishing grounds, 3 378; and northern temperatures, 1-293.
Gulf weed, a variety of seaweed, 6-526.
Gull. Seabird, 4 105; and albatross, 1 92.
Gulliver's Travels. Satire by Jonathan Swift, 7-205, with illus. f., 2-354.
Gum arabic, 4-107, 1 8.
Gums, 4-107; from eucalyptus, 3-305.
Gum-senegal, a muellage; in ink, 4 261; obtained from aracia, 1 8.
Gum tragacanth, 4-107.
Gun. See **Artillery**; **Firearms**, etc.
Gun cotton, an explosive; how made, 3 330.
Gunga Din. In Rudyard Kipling's poem, faithful Hindu water-carrier, who dies succouring his master. "Though I've belted you and flayed you . . . you're a better man than I am. (Gunga Din!)"
Gunmetal, used for making cannon; composition, 2-92.
Gunpowder. Oldest known explosive, consisting of saltpetre, charcoal and sulphur. First mixture described by Roger Bacon c. 1250; 3 329; in artillery and firearms, 1-258, 3 357; influence on medieval armour, 4 418; rocket and jet propulsion, 4 370.
Gunpowder Plot (Nov. 5, 1605), Guy Fawkes and, 3-343, 4-349.
Gunpowder rocket, how it works, 6 421 with diag.
Gunter, Edmund (1581-1626). Eng. mathematician; invented "chain" for land measurement; first to observe variation of the compass.
Gunter chain. Measure of length used in surveying; it is 22 yds. long and is divided into 100 links.
Gunter. King of the Burgundians in the Song of the Nibelungs, 5-429.
Gun turret, of battleship, 5-355 illus.; at naval gunnery school, 5-354 illus.

Gunwale. See **Nautical Terms** (list).
Gupta period (320-600), in Indian art, 4-249.
Gurkha. People of Nepal, 4-107, 5-386; Gurkha regiment, 1-252.
Gurnard. Marine fish of some 40 species. Large bony head; 3-frontis.
Gurney, Sir Goldsworthy (1793-1875). Inventor of steam-jet and Gurney steam omnibus.
Gustavus I. Vasa (1496-1560). King of Sweden, founder of Vasa dynasty; made king (1523) by Swedish peasants on expulsion of Danes; established Prot. Reformation in Sweden.
Gustavus II. Adolphus (1594-1632). King of Sweden, succeeded 1611; brilliant soldier and statesman; after wars with Denmark, Russia, Poland, Swedish territory extended; intervened (1630) in Thirty Years' War on Prot. side with success against Tilly and Wallenstein, but Gustavus was killed in victory at Lutzen; 7 270, 7 203; and army organization, 1 218; use of water mines, 5-219.
Gutenberg, Johann Gensfleisch von (c. 1400-68). Ger. pioneer printer, 6-288, 7 340.
Guthrum (d. 899). Danish chief defeated by Alfred, 1-103.
Gutta-percha. Rubber-like substance obtained from gutta-percha trees in Malay Peninsula, 4-108, 6 464.
Gutzkow [goots'kō], Karl Ferdinand (1811-78). Ger. dramatist and novelist; a leader in "Young Germany" school (*Ural Acacia*; *Die Ritter vom Geiste*).
Guy, Thomas (c. 1645-1724). Eng. bookseller, printer and philanthropist; he amassed a large fortune and bequeathed £300,000 to found the London hospital that bears his name.
Guy of Lusignan (d. 1195). King of Jerusalem; loss of Jerusalem, 3-2.
Guyot [gōō], Yves (1843-1928). Fr. journalist and economist of the liberal individualist school; editor of *Le Siècle* 1892-1903, and became editor of *Le Journal des Économistes*, 1909.
Gwalior. Former princely state of India (a. 26,000 sq. m.); absorbed in Madhya Bharat, 4-239.

HADRIAN'S WALL

Gwalior. City and cap. of Madhya Bharat, Rep. of India; pop. 80,500, 4-241.
Gwilym, Dafydd ap (c. 1340-1400). Welsh poet, 7-415.
Gwynn, Nell (1650-87). Eng. actress, favourite of Charles II; her wit, generosity, and kindness endeared her to the public.
Gyantse. A town of southern Tibet; pop. 7,850; 7-273 illus.
Gyges [gijéz]. In Gk. myth., hundred-handed giant flung into Tartarus for making war on the gods.
Gyges. King of Lydia (7th cent. B.C.). Possessor, according to legend, of magic ring that made the wearer invisible; with its aid he killed the reigning king and usurped his throne; legend told by Herodotus, 4-170.
Gymkhana [jilmkahn'a]. Anglo-Indian term for a miscellaneous sports or games meeting; originally used for the place of such a meeting. Sometimes used in title of sports club.
Gymnasium [jilmn'azium]. Place for regular physical exercise, with apparatus and equipment; from Gk. *gymnos*, naked. See **Athletics**; **Physical Education**.
Gymnastics. See **Physical Education**.
Gymnosperms. Plants producing naked seeds, including conifers, 7 315 2-21, 6-214.
Gynaecological surgery, 7-195.
Gynanisa maia. Moth, 2-143 illus.
Gynoeceum. Female part of flower commonly called the pistil, 3 396.
Gyp [hip]. Name given to a male servant of resident members of a Cambridge college (scout is the counterpart at Oxford). Humorous derivation from the Gk. *gypos* (vulture) with reference to alleged voracity in snatching up perquisites.
Gypsies. Nomad people, 4-109; Bor row and, 2 20; cave dwellings in Granada, 4-60; Libet and Hungarian Gypsy music, 4 522.
Gypsum. Mineral, usually white, used in making plaster of Paris, 4 112, 2 166; in cement mfr., 2-290 crystal, 3 1.
Gyro-compass, 4-113, 5 311.
Gyroscope, 4 112.

H

THE sound of the letter H is a weakened form of the Phoenician *cheth* which was pronounced like the Scots or German *ch*. This Phoenician letter consisted of two uprights connected by two or three transverse bars, H, H, and its name meant "fence." It was derived from the Egyptian hieroglyph representing a sieve ☉, which developed into the form ☉, and was finally transformed into the angular, ladderlike character. The

early Greeks wrote it **B** and later, omitting the cross-bars top and bottom, gave it the form of our H. Its sound ceased to be a guttural and became an aspirate or breathing sound like our *h*. The eastern Greeks lost the aspirate and adopted the symbol to represent the long *e*-sound (like our "a"), calling it *eta*. The western Greeks retained the aspirate, and the Romans took it over from them. But in vulgar Latin it disappeared.

Haakon [hawkon] IV (1204-63). King of Norway; added Greenland and Iceland to Norwegian kingdom; invades Scotland, 7 270.
Haakon VII (b. 1872). King of Norway; accepted Norwegian crown, 1905, on separation of Norway from Sweden, 5-485; mar. Maud, daughter of Edward VII of Gt. Brit.; in June 1940, after German invasion, came with his govt. to England; returned Sept. 1945; govt. in exile, 5-416.
Haarlem. Tn. in Netherlands, centre of bulb-growing region; pop. 161,980; 5-370, 371 illus., 375 illus.
Habakkuk [habak'kuk]. A Hebrew minor prophet, probably of 7th cent. B.C.; Book of Habakkuk, in the Old Testament, 8th of the works of the minor prophets.
Habarovsk. See **Khabarovsk**.
Habesha Corpus. In British Commonwealth and U.S. law, a writ requiring a person in custody to be brought before a court, 4-115, 4-53.

Haberdashers' Company, London, 4 526; arms, 4-165 illus. f.
Habibullah (1871-1919). Amir of Afghanistan; murdered in 1919; 1 47.
Habitat. Of birds, 1 155 6; of plants, 2-25.
Habsburg. See **Hapsburg**.
Hackney. Met. bor. of N.E. London; chiefly residential dist.; severe air-raid damage in 2nd World War; pop. 171,337; 5-27.
Haddenham Hill. Highest point of Chiltern Hills, Bucks (837 ft.), 2-105.
Haddington. Co. tn. of East Lothian, Scot.; pop. 4,497; 5-10.
Haddingtonshire. Former name of East Lothian, Scot., 5-39.
Haddock. Edible marine fish, 4-115. See also **Fish** (list).
Had' don Hall. Famous old mansion in Derbyshire, England, 30 m. S.E. of Manchester; seat of Duke of Rutland; associated with Dorothy Vernon.

Ha'den, Sir Francis Seymour (1814-1910). Brit. etcher and surgeon; in addition to distinguished career as surgeon, became foremost Brit. etcher, causing revival of etching in England; 3 300.
Hades (god). See **Pluto**.
Hadhranaut. Region along S. coast of Arabia; pop. 150,000; products, 1-191; Shillam, 4-192 illus.
Hadley, John (1632-1744). Eng. mathematician; invented sextant, 5-338.
Hadrian (A.D. 76-138). Roman emperor, 117-138. Travelled to almost every province of his empire. Introduced reforms in taxation and law. Instituted a regular civil service, 6-439; aqueduct for Carthage, 6-416 illus.; Hadrian's Wall, 3-275 illus., 2-74, 75 illus.; rebuilt Jerusalem, 4-363.
Hadrian's Tomb. See **Sant' Angelo**, **Castle of**.
Hadrian's Wall. Rom. fortification across N. Eng. between the Tyne and

HAECKEL

- Solway Firth**, 3-249, 3-9, 2-75 illus., 3-275 illus.
- Haackel** [hek'el], **Ernst Heinrich** (1834-1919). Ger. biologist; advocated Darwinian views; aroused controversy by anti-theological attitude; 6-160.
- Haematin**, substance contained in haemoglobin, 1-189.
- Haematite**. Form of iron ore, with red metallic lustre. Red ochre, used for colouring and as an abrasive, is an impure form; crystals, 5-213 illus.; iron ore from, 4-288.
- Haematoxylon**. See **Logwood**.
- Haemoglobin**, substance contained in the red corpuscles of blood; iron in, 5-177; and oxygen, 1-489; and respiration, 5-52.
- Haemon** (hé'mon). In Gk. myth., son of Creon.
- Haemophilia**. Condition in which blood fails to clot, 1-491; inherited, 4-168.
- Hafr** [hah'fai]. Pen name of Shams ud-din Mohammed (d. c. 1388), greatest Persian lyric poet; tomb near Shiraz is a celebrated place of pilgrimage.
- Hafnium** (Hf). Chem. element; atomic no. 72; atomic weight 178.6; 3-224.
- Haganah**. Jewish army, illegally formed in Palestine, 1936-39, to resist the Arab revolt; trained and used in 2nd World War by Brit.; disbanded in 1943; finally disbanded May 1948, when Israeli state declared; 4-302.
- Ha'gar**. Sarah's handmaid, mother of Abraham's son Ishmael (Gen. xvi, xxi); banishment of, 2-5.
- Hagen, Walter** (b. 1892). Amer. golfer; U.S. open golf champion (1911, 1919); British open golf champion (1922, 1924, 1928).
- Hagenbeck** [hah-gen-beck], **Carl** (1844-1913). Ger. animal dealer and showman, first to train "happy family" groups of lions, tigers, dogs, cats, rabbits, mice, living or performing together; introduced many improvements in methods of caring for and exhibiting animals.
- Hag Fish**. Eel-like creature; as fish parasite, 6-78.
- Haggai** [hag'gai]. The 37th book of the Old Testament and 10th of the minor prophets. Haggai prophesied about 580 B.C.; appealed to his countrymen to restore the temple.
- Haggard, Sir Henry Rider** (1856-1925). Brit. writer and novelist, esp. successful in stories of adventure in the African interior, 4-115.
- Haggard**. In hawking, the full grown bird, 4-141.
- Haggis**. Scot. dish; minced heart, liver and lungs of a sheep, mixed with chopped suet, oatmeal, and seasoned. The whole is boiled in a sheep's stomach.
- Hagiographa** [hag-iog'ra-fa], or "Holy Writings." Books of the Hebrew Scriptures which are not included in the Law and the Prophets.
- Hague, The**. Seat of govt. in the Netherlands; pop. 371,853; 4-116, 5-370, 5-380 illus.; armament conferences, 1899, 1907, 3-316; in Ger. occupation, 5-372; International Court of Justice, 4-459.
- Hague Tribunal**. A permanent court of international law, composed of not more than four delegates appointed from each state; created at first Internat. Peace Conference (1899), merged with International Court of Justice, 4-459.
- Hahn, Otto** (b. 1879). Ger. chemist and physicist; discovered the radioactive substances radiothorium and mesothorium, and the element protactinium; foremost in atomic research in Ger.; went to U.S.A. during Hitler's régime; awarded Nobel prize for chemistry in 1944; pres. of Kaiser Wilhelm Gesellschaft, Göttingen, since 1948; work on atomic fission, 1-300.
- Hahnemann** [hah'neman], **Samuel C. F.** (1755-1843). Ger. physician, founder of homeopathy (q.v.).
- Haidar** or **Kaidar**. People of Alaska, 1-90.

- Haifa** [hi'fa], Israel. Spt. 70 m. N. of Jerusalem at foot of Mt. Carmel; pop. about 145,000; terminus of oil pipeline from Iraq.
- Haig, Douglas Haig, 1st Earl** (1861-1928). Brit. soldier, 4-117, 7-179.
- Hail**. Pellets of ice formed during a thunderstorm, 4-117.
- Halle Selassie** [hi'fē selah'sē] (Itas Tafari), (b. 1892). Emperor of Abyssinia (1930); fled country when Italians invaded it in 1936; reinstated, 1941; 1-7.
- Halleybury and Imperial Service College**. Public school near Hertford, Eng.; originally college of East India Co. Halleybury amalgamated with I.S.C. 1942.
- Halisham, Douglas Hogg, 1st Viscount** (1872-1950). Brit. statesman and lawyer; attorney-general (1922-24, 1924-28); lord chancellor (1928-29); sec. of state for war (1931-35); lord chancellor (1933-38); lord pres. of the council (March-Oct. 1938).
- Hainan** [hi'nahn']. Chinese isl. 10 m. S. of China, in China Sea; area, 13,900 sq. m.; pop. est. 1,500,000; jungle covered mts.; rich valleys; sugar-cane, cotton.
- Haiphong**. Tn. in Vietnam, Indo-China; pop. 31,500; 4-257.
- Hair**, 4-117; beards, 1-397; human hair in hygrometer, 4-225; hygiene of, 4-224; in mammals, 5-100; Roman hairstyle, 6-137 illus.
- Hairbell**. See **Marbell**.
- Hairy Ainu**. Primitive people; type of beard, 1-398 illus.
- Hairy Brome**, grass, 4-frontis.
- Haiti, Republic of**. On island of the Greater Antilles; area 10,714 sq. m.; pop. 3,111,973; cap. Port-au-Prince; 4-118; and Dominican republic, 3-106; flag, 3-385 illus. f.
- Hajji**. Name given to a Mahomedan who has made the pilgrimage to Mecca, 5-88; 5-156.
- Hake**. A large marine fish closely related to the cod, but not so popular as food; usually eaten fresh, occasionally smoked and dried; found round the Brit. coasts; 3-379.
- Hakluyt** [hak'loot], **Richard** (c. 1552-1616). Eng. geographer; the Hakluyt Society is named after him. (*Voyages and Discoveries of the English Nation*.)
- Hakodate** [hakikōdai't]. Japan. Fortified promontory in s. Hokkaido; pop. 207,000; exports fish products, charcoal, sulphur, timber.
- Haleyon**. Anc. name for the kingfisher, 4-404.
- "Haleyon days," origin of phrase, 4-401.
- Haleysone**. See **Aleypsone**.
- Haldane** [haw'dān], **Richard Burdon Haldane, 1st Viscount** (1856-1928). Brit. statesman, lawyer, and philosopher; war minister 1905, establishing O.T.C., Territorial Army and Imperial General Staff; lord chancellor 1924; peerage and O.M. 1911.
- Haldane, John Burdon Sanderson** (b. 1892). Brit. scientist and author. Fullerian prof. of physiology of the R.I., and later prof. of genetics at University College, London; a brilliant biologist and experimenter, he served in 1st World War and Spanish Civil War; chairman *Daily Worker* 1940-49. Wrote *Possible Worlds*, 1927; *Inequality of Man*, 1932; *New Paths in Genetics*, 1941; *Science Advances*, 1947.
- Haldane, John Scott** (1860-1936). Brit. physiologist; made a special study of the respiratory functions, esp. in relation to industry.
- Halden** (Norway). See **Frederikshald**.
- Hale, Edward Everett** (1822-1909). Amer. preacher, social worker and writer (*The Man Without a Country*), 7-364.
- Haler**. See **Money** (table).
- Haleyvy** [ah'fai'vī], **Jacques** (1790-1862). Fr. (Jewish) composer (*La Juive* and *L'Éclair*); a master of fine effects of vocalisation and instrumentation; 5-514.
- Haleyvy, Ludovic** (1834-1908). Fr. dra-

HALLEY

- matist and novelist (*L'Abbé Constantin*, sweetly sentimental, immensely popular tale, classic for Fr. instruction).
- Halfa**. See **Wadi Haifa**.
- Half aum**. See **Weights** (table).
- Half-crown**. Brit. coin, value two shillings and sixpence. Made in silver from Edward VI's reign until 1946; since 1947 from cupro-nickel, 5-233 illus. f.; Irish coin, 4-285 illus.
- Halfpenny** [hāp'ni]. Brit. coin; issued in copper 1672-1860, and in bronze alloy from 1860 onwards; Irish coin, 4-285 illus.
- Half-tester**, type of bed, 1-104.
- Half-timber work**. See **Architectural Terms**.
- Half-tone Process**, in process engraving, 6-292, 293.
- Haliburton, Thomas Chandler** (1796-1865). Canadian humorist; pen name "Sam Slick"; lawyer and judge in Nova Scotia, 2-203.
- Halibut**. Fish, 4-119, 3-379; liver oil, 3-377, 7-401.
- Halioarnassus**. Anc. Gk. city of Asia Minor; memorial to Mausolus, called the Mausoleum, was one of the Seven Wonders of the world, 7-1.
- Halifax, Charles Montague, Earl of** (1661-1715). Brit. statesman; introduced into Gt. Brit. national debt instead of annual taxation.
- Halifax, Edward Frederick Lindley Wood, 1st Earl of** (b. 1881). Brit. statesman; under-sec. for colonies (1921-22); pres. of board of education (1922 and 1932) and minister of agriculture (1924); viceroy of India as Baron Irwin (1926-31); succeeded as viscount 1934; sec. for war (1935); foreign sec. (1938); ambassador U.S.A. (1940-46). Created earl 1944.
- Halifax, George Savile, 1st Marquess of** (1633-95). Eng. statesman and author; supported the accession of James II, but later allied himself with William of Orange; great orator.
- Halifax**. Mfg. city in W. Riding of Yorkshire; pop. 98,370; textiles, iron products, chemicals, coal-mining, quarrying, toffee; 3-249.
- Halifax**. Cap. of Nova Scotia prov., Canada; pop. 85,589; 4-119, 5-169.
- Halifax "Maiden"**. Form of guillotine used at Halifax, Yorks. mid. 17th cent. See also **Guillotine**.
- Haliotis**. See **Abalone**.
- Hall, Charles M.** (1863-1914). Amer. chemist; invented electrolytic process for extracting aluminium, much reducing its cost, 1-128.
- Hall, Sir Edward Marshall** (1858-1927). Brit. lawyer and politician, the most famous criminal advocate of his time.
- Hall, Joseph** (1574-1656). Eng. divine and satirist; Bishop of Exeter in 1627; of Norwich in 1641; supported the ecclesiastical policy of Charles I and Archbishop Laud; imprisoned and expelled from his see during the Long Parl.
- Hallam, Henry** (1777-1859). Brit. historian; his writings are clear, graceful, and sound in judgment (*View of the State of Europe During the Middle Ages; Constitution; History of England*); father of Arthur Henry Hallam, subject of Tennyson's *In Memoriam*.
- Hallé** [hal'ā], **Sir Charles** (1819-95). Brit. musician of Ger. birth; founded famous Hallé orchestra in Manchester; his wife, formerly Mme. Normann Neruda (1839-1911), was one of the greatest violinists of her time; Hallé orchestra, 5-111.
- Halle** [hal'e], Ger. City E. Germany on r. Saale; pop. 220,300; salt works; noted univ., 4-4.
- Hallelujah** [halo'lojya]. A Hebrew word meaning "praise the Lord."
- Hallelujah Chorus**, from *Messiah* by Handel, 4-126.
- Hallé Orchestra**, Manchester, 5-111.
- Halley, Edmund** (1656-1712). Eng. astronomer royal from 1719 until his death. Name given to comet whose course he predicted, 4-65; and Newton, 5-409; and Sirius, 7-147.

HALLEY'S COMET

Halley's comet, 2-473, 172 illus., 2-468.
Hall Mark. Official mark stamped on gold or silver plate at Goldsmiths' Hall, or at assay offices, to attest quality, 7-56.
Hall of Mirrors. The throne-room of the palace of Versailles, 7-394.
Hallowe'en. The evening of Oct. 31, eve of All Saints' Day, 4-119; Scot. customs, 4-134.
Hallstatt (hah'shtah't). Tn. of Upper Austria on L. Hallstatt; old and famous salt mines; anc. Celtic remains of Iron and Bronze Ages, dating back 3,000 years or more.
Halobates. Species of bug found in the sea, 4-264.
Halogens. Name given to 4 non-metallic elements: bromine, chlorine, fluorine and iodine, 4-120, 4-276; in daily life, 4-120 illus. f.
Halophytes. Plants which live in salt-water environment.
Hals, Frans (c. 1580-1660). Dutch painter, 4-121, 5-384; The Laughing Cavalier, 4-121 illus. f.; Nurse and Child, 5-389 illus.
Hal'sey, William F. (b. 1882). Amer. sailor; commdr. in S. Pacific Oct. 1942; commanding U.S. 3rd fleet in Pacific 1944, defeated Japs. at Leyte Gulf, Oct. 1944; Jap. surrender signed on his flagship *Missouri*, Sept. 2, 1945.
Halteres. Sensory projections on two-winged flies (*Diptera*); how they stabilize flight, 4-284.
Halter hitch, type of knot; how to tie, 4-422 illus.
Ham. One of Noah's sons in the Biblical story, 5-445.
Ham (meat). See Bacon and Ham.
Hama (hah'mah). City of Syria on the Orontes, 110 m. N. of Damascus; pop. 146,561; 7-217.
Hamadan. Tn. in Persia; pop. 122,000, 6-132, 131.
Hamadryad (wood-nymph). See Dryad.
Hamadryad. Name sometimes given to the king cobra; 2-436.
Hamadryad Baboon. Native to Arabia and N.E. Africa, 5-242.
Hambleton. Village of Hants Eng.; traditionally the first cricket club was formed here in 1750; matches were played on Broadhalfpenny Down, 2-528.
Hambourg, Mark (b. 1879). Anglo-Russian pianist of great merit; first public appearance in 1888.
Hamburg. Ger.; port and city-state, one of the Federal German *Länder* or regions; pop. 1,605,606; 4-121, 4-3, 4.
Hamel, Gustav (1889-1914). British aviator. Piloted first air mail service (Hendon-Windsor) 1911; lost on cross-Channel flight, May 20, 1914; 1-41.
Hameln or Hamelin. Tn. of W. Ger., in the Land of North Rhine-Westphalia on r. Weser; made famous by Robert Browning in "The Pied Piper of Hamelin."
Ham House. Richmond, Surrey, seat of Earl of Dysart, built in 1610; notable for its art collection. Given to the Nat. Trust in 1918 and opened to public in 1950; 5-300.
Hamloar Barca (c. 270-228 B.C.). Carthaginian general; father of Hannibal; war with Rome, 4-127; and Barcelona, 1-368.
Hamilton, Alexander (1757-1804). Amer. statesman. On Washington's staff in war of independence, became first sec. of treasury, setting up a national bank and protective tariffs. One of the framers of the constitution; killed in a duel.
Hamilton, Emma, Lady (c. 1761-1815). Brit. beauty of lowly birth, who married Sir William Hamilton and was the intimate friend of Lord Nelson, 5-366; Romney portraits, 5-260.
Hamilton, Sir Ian (1853-1947). Brit. general; served in the army from 1872 until 1919; led Dardanelles expedition in 1st World War.
Hamilton, James, 1st Duke of (1606-49). Scot. politician; was adviser to Charles I.; led the Scottish forces

that invaded Eng. with the object of restoring Charles II and was defeated at Preston, being taken prisoner and executed.
Hamilton. Tn. of Lanark, Scot. 11 m. S.E. of Glasgow; coal, ironstone, cotton mfrs.; pop. 40,029; 4-144.
Hamilton. Chief tn. and spt. of Bermuda; pop. 3,500; 1-435.
Hamilton. Tn. in Ontario prov. Canada; pop. 208,321; centre of Canadian steel industry; 5-513.
Hamilton or Grand River, Canada. Chief r. of Labrador; flows E. 600 m. into Melville L., extension of Hamilton Inlet on Atlantic coast; water power, 4-498.
Hamlet. Shakespeare's tragedy, 4-122, 7-14.
Hamm. Tn. in North Rhine-Westphalia, Ger., 19 m. N.E. of Dortmund; on the Lippe, at E. end of Ruhr; the chief Ger. rly. centre.
Hammarskjöld, Dag H.A.C. (b. 1905). Swed. banker, politician, and minister; sec.-general of United Nations from 1953.
Hammer, Throwing the. In athletics; standard performance, 1-292.
Hammerbeam. A beam in Gothic architecture which projects from the wall, forming a kind of bracket-support for the tie-beams of an ornamental roof.
Hammerhead Crane. In eng., 2-525.
Hammerhead Shark, 7-18.
Hammersmith. Met. bor. of London; pop. 119,317; boat-building, iron and dye works; 5-27.
Hammerton, Sir John Alexander (1871-1949). British writer, editor of encyclopedias and other works of reference; a former editor of THE BOOK OF KNOWLEDGE. Among many other popular works edited and mostly originated by him were *The Universal Encyclopedia*, *People of All Nations*, *Countries of the World*, *Wonders of the Past*, *The Universal History of the World*, *The Outline of Nature*, *Practical Knowledge for All*. Throughout both World Wars edited a weekly periodical, *The War Illustrated*, and standard contemporary histories in many volumes; first editor of *World Digest*; wrote books on Stevenson, Meredith, Barrie, Northcliffe, and his own memoirs, *Books and Myself*.
Hammound, Walter Reginald (b. 1903). Eng. cricketer. Played in Test matches; outstanding as batsman and bowler; became an amateur and captained England against Australians in 1938 and 1916-47; South Africa (1938-39) and W. Indies (1939).
Hammond. Tn. of Indiana, U.S.A. pop. 87,594; 4-255.
Hammurabi (2123-2081 B.C.). Founder of the first Babylonian Empire; his rule and laws, 4-336, 337, 5-176.
Hampden, John (1594-1643). Eng. politician and patriot, 4-123, 6-22.
Hampden Park, Glasgow. Chief Scot. Association football stadium.
Hampshire. Eng. co.; area 1,503 sq. m.; pop. 1,196,617; co. town, Winchester; 4-123; downs, 3-111; watercress beds, 7-127 illus. Isle of Wight, 7-449, 450 illus., 7-157.
Hampshire Down sheep, 7-22.
Hampstead. Met. bor. in N.W. of London; pop. 95,073; formerly noted for mineral springs; residence of many famous in art and letters, notably John Keats; 5-27; Keats house, 4-394 illus.
Hampstead Heath. Open space of 240 acres in Hampstead; famous fair-ground on Bank Holidays, 3-337 illus.
Hampton Court. Historic palace on Thames, 10 m. S.W. of London, built by Cardinal Wolsey in 1515, 4-124, 7-167, 7-501 illus.; "real" tennis court, 7-256, 257 illus.
Hampton Roads. Channel between James r. estuary and Chesapeake Bay, Va., U.S.A.; scene of the encounter between the *Monitor* and the *Merrimac* during Amer. Civil War.
Hamster. Small rodent native to Asia and N. Europe. Up to 8 in. long,

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with small stump of tail. Golden and brown varieties. Capacious cheek pouches. Feeds on roots, grain, fruit. Has become popular as a children's pet.
Hams'un, Knut (1859-1952). Norwegian novelist, 1920 Nobel prize-winner in literature (*Growth of the Soil*; *Hunger*; *Pan*).
Han, r. of Cent. Korea; flows 280 m. south of Seoul, the cap., into the Yellow Sea, 4-426.
Hancock, Walter (1799-1852). Brit. engineer; invented steam omnibus, 6-413, 412 illus.
Hand. In anatomy, 4-125; of monkeys, 5-240; skin of, 7-63.
Hand. In measurement of horses, unit of 4 in., 4-197.
Hand cannon. Early firearm, 3-358, 359 illus.
Handel, George Frederic (1685-1759). Ger.-Eng. composer, 4-126; works, 5-305.
Handicaps, in horse-racing, 4-198; in golf, 4-46.
Handkerchiefs, weaving, 7-431 illus.
Handley Page Hannibal. Biplane air liner, 1-40 illus.
Handley Page Victor. Jet bomber, 4-369 illus.
Hand-loom weaving, 5-38.
Handwriting. See Writing.
Han Dynasty (206 B.C.-A.D. 221). Rulers of China; pottery and painting, 2-363.
Hangchow. City, China; pop. over 600,000; 4-126.
Hanging Gardens of Babylon, built by Nebuchadnezzar; reconstruction, 1-336 illus. f.; ruins, 1-337 illus. f.
Hangö. Fortified spt. of Finland, on peninsula at the entry to the Gulf of Finland; leased to U.S.S.R. for 30 yrs. as military base by treaty of 1940; Sept. 19, 1944, U.S.S.R. exchanged rights here for a sea and air base near Helsinki.
Hank. In cotton counting, 2-520.
Hankow, China. River port at junction of Han r. with the Yangtze. With Hanyang and Wuhan forms one city known as Wuhan, 4-126.
Hanley. One of the five towns now constituting Stoke-on-Trent, Staffs., 7-141; potteries, 1-429 illus.
Hannibal (247-182 B.C.). Carthaginian general, 4-127; and 2nd Punic War, 2-255; battles in Po valley (218 B.C.) 6-232.
Hannover (Ger.). See Hanover.
Hanoi (hanoh'). Cap. of Vietnam and cap. and largest city of Tonkin, in N. on Songkai (Red) r.; pop. 160,000; trade in silk, rice, 4-257.
Hanover. City of W. Germany; pop. 141,296; 4-128.
Hanoverian Dynasty, in Gt. Brit., 4-128.
Hansa League. See Hanseatic League.
Hansard. Popular name for the official record of Brit. parliamentary proceedings, so called after Luke Hansard (1752-1828), who printed the *Journals of the House of Commons*. It has been a government publication since 1909; 6-91.
Hanseatic League. Medieval confederation of N. European cities for promotion of trade, 4-128; Bremen, 2-35.
Danzig, 3-49.
Hänsel and Gretel. Opera by Humperdinck; story, 5-517.
Hansen, Gerhard Henrik Armauer (1841-1912). Norwegian physician, discoverer of leprosy bacillus.
Hansom cab. Vehicle popular in the latter half of the 19th century—invented by Joseph Alchamius Hansom (1803-82), 6-415, 414 illus.
Hanuman Monkey. Sacred monkey of India, 5-241, 242 illus.
Harway, Jonas (1712-86). British philanthropist; first man of prominence to carry an umbrella regularly in the streets of London, 7-344, 345.
Hanyang, China. One of the three cities forming the metropolis Wuhan 4-126.
Hapsburg. House of. Famous Ger. princely family which gave rulers to Austria, Spain and Holy Rom. Empire, 4-126, 4-7; Austro-Hun

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garian empire, 1-326; and Holy Rom. empire, 4-188; and Hungary, 4-206; Maria Theresa, 5-125.

Hara, Takashi (1856-1921). First commoner to become prime minister of Japan (1918) and first prime minister directly responsible to parliament; previously leader of Seiyu-Kai (Liberal) party and three times minister of home affairs; assassinated.

Hara-kiri [hahrak'ri]. Form of suicide in Japan; obligatory harakiri, formerly common, was abolished in 19th cent., but voluntary form is still sometimes practised out of loyalty to a dead superior, to avoid dishonour in battle, or as protest against a national policy.

Haram es-Sharif. (The Venerable Sanctuary.) Site of the Old Temple in Jerusalem; and the Dome of the Rock, 4-361.

Harappa. Anc. city of Indus valley, sub-continent of India; civilization 4-251.

Harar. Tn. in Abyssinia, 1-8 illus.; Burton's visit to (1854), 2-133.

Har'bin or Kharbin, Manchuria. Tn. and rly. centre on Sungari r.; pop. 115,000; 5-112.

Harbour, 4-130; artificial harbours, 2-54; dredging, 3-125; Mulberry harbours, 5-290, 291 illus.; Portsmouth, 6-265; St. John's, Newfoundland, 5-395 illus.

Harbour Grace, Newfoundland. Second spt. of the isl. on Conception Bay, connected with St. John's, 25 m. w.; by Newfoundland r.; pop. 3,800; boots and shoes, cod liver and seal oils, fish, starting point of several Transatlantic flights.

Harcourt, Sir William Vernon (1827-1904). Brit. statesman and debater; loyal lieutenant of Gladstone; home sec. (1880-85); as chancellor of exchequer (1892-95) introduced graduated income tax.

Hardanger Fjord, Norway. Inlet 75 m. long on w. coast; bridal procession, 5-165 illus.

Hardanger work, type of embroidery, 3-239, 238 illus.

"Hard", currency. In finance, 3-419.

Hardenberg, Karl August, Prince (1750-1822). Prussian statesman; with Stein, rebuilder of Prussia after Napoleonic wars; abolished serfdom.

Hardicanute (c. 1018-42). King of Denmark and Eng. Son of Canute; succeeded brother Harold 1040; brief reign marked by cruelty, 4-133.

Hardie, (James) Keir (1856-1915). Brit. Labour leader and politician; a miner by trade; worked for Independent Labour party; first Labour member of Parliament 1892; chairman of Independent Labour party 1894-99, 4-427 with illus.

Hardiman, Alfred Frank (1891-1919). Brit. sculptor; works, statue of Earl Haig; stone and bronze sculpture for Norwich City offices.

Harding, Warren Gamaliel (1856-1923). 29th pres. of U.S.A.

Hardinge, Henry Hardinge, 1st Viscount (1785-1856). Gov.-gen. of India, 1844-48; bomb incident, 4-254.

Hard paste porcelain, Dresden and Sevres ware, 6-277.

Hardware and Hollow-ware, enamelling, 3-244.

Hard water, 7-427.

Hardwicke, Philip Yorke, 1st Earl of (1690-1764). Eng. lawyer; became solicitor-gen. (1720), chief justice (1733), and lord chancellor (1737).

Hardwood. Variety of timber, 3-421, 422, 7-277.

Hardy, Thomas (1840-1928). Brit. novelist and poet, 4-131, 3-291, 5-470.

Hardy, Sir Thomas Masterman (1760-1839). Commander of H.M.S. *Porpoise*, Nelson's flag-ship; and Nelson, 5-364.

Hare, Sir John (1844-1921). Brit. actor and theatrical manager; associated with the Bancrofts in Robertsonian plays; a fine character actor.

Hare. Rodent of the *Leporidae* family, 4-134; bunting of, 4-209; protective coloration, 6-297 illus. f.; compared with rabbit, 6-327.

Harebell (Scottish bluebell), 1-494, 2-24 illus. f.

Hare's Ear. Plant; leaves, 4-471 illus.

Hare's-foot Trefoil. See under Trefoil.

Harwood [har'wood], Henry George Charles Lascelles, 6th Earl of (1852-1947). Served in 1st World War, winning D.S.O. and Croix de Guerre; married Princess Mary, daughter of King George V, in 1922; two sons.

Harwood, George Henry Hubert Lascelles, 7th Earl of (b. 1923). Served in 2nd World War; in 1941 taken prisoner by Germans while serving with Grenadier Guards in It.; liberated 1945; succeeded to title in 1947.

Harfleur [ahr'fler]. Tn. in N. France, 4 m. E. of Havre; pop. 4,400; formerly important spt.; twice occupied by English in 15th cent.

Hargeisa. Cap. of British Somaliland, 7-84.

Hargreaves, James (1730-78). Inventor of the spinning jenny, 4-132, 1-239, 7-136; and Blackburn cotton mfr., 1-477.

Haricot bean, 1-390.

Harrington, or Harrington, James (1611-77). Eng. political writer, best known for his *Oceana*, published 1656, which advocated an ideal form of government based on equality of forces and continuous change of officers.

Harlech. Tn. in Merionethshire, Wales; pop. 1,100, 5-175.

Harlem. Dist. of New York City, U.S.A., and centre of Negro urban pop. Name dates from 17th cent., when a settlement was estab. by the Dutch and called Haarlem.

Harlequin [hahr'lekwin]. In old comedy and pantomime, conventional character in spangled motley, in love with Columbine, 4-132, 133.

Harlequinade, 4-132; and pantomime, 6-60.

Harlequins. Famous Rugby football club with headquarters at Twickenham, Middlesex, Eng.

Harley Street. London thoroughfare in bor. of St. Marylebone. Because of the many medical specialists who had consulting rooms here, the name has become a synonym for the higher levels of the medical profession.

Harlow. Tn. in Essex, Eng.; pop. 5,828; from 1947 developed as a satellite town of London, 1-219.

Harmattan. Hot E. wind blowing at intervals from Dec. to Feb., from the Sahara Desert to W. coast of Africa heavily laden with sand and dust.

Harmonica. See Mouth-organ.

Harmonies, 7-86-87.

Harmonium. A cabinet organ, 6-3.

Harmony, in music, 5-301; and part singing, 7-57.

Har nack, Adolf (1831-1930). One of the most stimulating and prolific of modern Church historians, born in Russia, taught after 1889 at Univ. of Berlin; claimed absolute freedom in study of Church history and New Testament; preached practical Christianity as a religious life, not as a system of theology. His many works include *History of Christian Dogma*, *What is Christianity?* and *The Sayings and Discourses of Jesus*.

Harney Peak. Mt. in S. Dakota, U.S.A., 7,242 ft., 3-28.

Harold I (called Harefoot; d. 1040). Eng. king, 4-133.

Harold II (c. 1022-1066). Eng. king, killed at battle of Hastings, 4-133, 3-276, 7-451.

Harold I (850-933). "Fair Hair," first king of united Norway, succeeded 872; conquered petty local kings, many of whom fled to harry and conquer elsewhere, as Rolf or Rollo the Ganger in Normandy, 5-465; and Orkney, 6-5.

Harold III Haardrade (1015-66). King of Norway, succeeded 1047; sought to conquer England with Toetig; fell at Stamford Bridge, Yorks, 4-133; foundation of Oslo, 6-7.

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Haroun-al-Raschid [bahroon ashira'shéd] (763-809). Abbasid caliph of Baghdad 786-809; scholar, poet, patron of learning, literature, and music, one of the greatest princes of his day, but a poor administrator; hero of stories in *Arabian Nights*, 1-196; and *Charlemagne*, 4-363.

Harp. Musical instrument, 4-133, 5-307.

Harper's Ferry, W. Virginia, U.S.A. Tn. at junction of Shenandoah and Potomac rivers; pop. 766; scene of John Brown's raid, 2-93.

Harpies. Bird monsters with the faces of old women, the ears of bears, and crooked talons, in Gk. and Rom. myth.; the name means "the robbers," and they are supposed to be a personification of the storm winds.

Harpoon, spear-like missile, with a rope attached for catching large fish, seals, whales; used by Eskimos, whalers, etc., 7-447.

Harpsichord. Musical instrument, ancestor of piano, 5-194, 5-309, 307 illus.; orchestral direction from, 5-526.

Harran [harrahn'], also Haran, or Charran. In Bible times a thriving city in N. Mesopotamia; ruins.

Harrier. Breed of Eng. dog used in hunting hares, 4-209.

Harris, Sir Arthur Travers (b. 1892). British air officer; chief of Bomber Command 1942-45; advocate of mass raids on Ger. industrial centres; wrote *Bomber Offence*. Created a baronet 1953.

Harris, Joel Chandler (1848-1908). Amer. author; unequalled Negro character and folk-lore tales (*Uncle Remus*, *Brer Rabbit*), 2-351, 7-366.

Harris. Peninsula in the Outer Hebrides; famous for "Harris tweed," woven on hand looms. See Lewis-with-Harris.

Harrisburg. Cap. of Pennsylvania state, U.S.A.; pop. 89,544, 6-119.

Harrison. Tn. in Orange Free State, S. Africa. Founded 1810, named after Sir Harry Smith, then gov. of Cape Colony, 5-524.

Harris tweed, 4-152, 2-419 illus.

Harrison, Benjamin (1833-1901). 23rd pres. of U.S.A., 1889-1893.

Harrison, Frederic (1831-1923). Brit. historian, jurist, literary critic, and Positivist philosopher; voluminous writer (*The Meaning of History*; *The Choice of Books*).

Harrison, John (1693-1776). English clockmaker; invention of chronometer, 2-383.

Harrison, William Henry (1773-1841). 9th president of U.S.A., elected 1840; served with distinction in the War of 1812.

Harrogate. Tn. and spa in W. Riding of Yorks, Eng. Tourist centre and health resort; medicinal springs, pop. 50,454.

Harrow. Tn. in Middx, Eng.; pop. 219,463; public school, 5-200.

Harrow. A farm implement, having iron teeth that break up the soil when dragged over it; there are various types.

Harrow School. Famous Eng. school for boys at Harrow-on-the-Hill, 12 m. N.W. of London; founded 1571; most famous sporting event is cricket match v. Eton at Lords; "Calling Bill," 6-505 illus.

Hart, Sir Robert (1836-1911). Anglo-Chinese statesman; inspector-general of imperial Chinese customs (1862-1907); placed Chinese national finance on solid footing.

Harte, Francis Bret (1839-1902). Amer. writer of poems and stories of western life, 7-365, 364 portrait.

Hartebeests. Species of antelope, native to S. Africa, 1-171.

Hart Fell. Mt. in Dumfriesshire, Scot., 2,651 ft., 3-134.

Hartford. Cap. of Connecticut, U.S.A.; pop. 177,397; engineering works, 2-486.

Hartland Point. Headland in N.W. Devon; has a lighthouse.

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Hartlepool. Spt. tn. in Durham; pop. 17,917; West Hartlepool, lying to the w., is also a spt.; pop. 72,597; exports coal, iron ores; shipyards, iron and steel works.

Hartmann, Karl Robert Eduard von (1842-1908). Ger. philosopher; taught that existence is evil, and happiness an illusion, 6-180.

Hartmann von Aue (c. 1187-c. 1220). Ger. poet, 4-13.

Hartshorn. Old name for ammonium carbonate, 1-140.

Harty, Sir (Herbert) Hamilton (1880-1941). Brit. composer and conductor, conductor of Hallé Orchestra from 1920 to 1933.

Harun-al-Raschid. See **Haroun-al-Raschid**.

Harunobu (1725-70). Jap. artist and colour printer, 4-354.

Harvard, John (1807-38). Amer. clergyman; b. in Eng., founder of Harvard Univ., 4-134; and Stratford-upon-Avon, 7-171.

Harvard University, Cambridge, Mass., U.S.A., 4-134, 2-182; comparative zoological museum, 1-67.

Harvest, 4-134; harvesting wheat, 7-447, 448.

Harvestman. A spider-like arachnid with unusually long legs.

Harvest Moon. Nearest full moon to the autumnal equinox, Sept. 22 or 23. At this period the moon rises at approx. the same time on several successive evenings.

Harvest mouse, 5-288; foot, 3-413 illus.

Harvey, William (1578-1657). Eng. physician, who demonstrated the circulation of the blood, 4-135; 1-492, 5-162, 1-143.

Harwell. Hamlet of Berkshire, Eng., 2 m. w. of Didcot; site of experimental atomic installations; nuclear reactors at, 4-302 with illus.

Harwich [ha'rij]. Tn. on E. coast, chief spt. of Essex; 65 m. N.E. of London; pop. 13,488; port for passenger ships to the Hook of Holland, etc.; 3-298.

Harwood, Sir Henry H. (1888-1950). Brit. sailor; commodore of the S. Amer. div. and captain of H.M.S. *Erebor*, whose strategy led to retreat and scuttling of the Ger. pocket battleship *Adm. Graf Spee* Dec. 1939.

Harz Mountains, Germany, 4-135.

Hasan [hasan] and **Husein** [hoo'sin]. Grandsons of Mahomet, sons of Fatima and Ali; killed A.D. 689 and 680 respectively by adherents of the Ommayyad caliphs and revered as martyr saints by the Shiites.

Hasdrubal (d. 207 B.C.). Carthaginian general, son of Hamilcar Barca and brother of the great Hannibal, slain at the Metaurus, 4-127.

Hashish. Drug produced from *Cannabis indica*, Indian hemp; *Assassins* and, 1-276; effects of, 4-161, 3-127.

Hashishin. See *Assassins*.

Hassan Ibn Sabbah (d. 1124). The "Old Man of the Mountains," founder of the Assassins, 1-276.

Hastate. Bot. term for a leaf type in which there are lobes running back on either side of the leaf-stalk, 4-471 with illus.

Hastenbeck, Battle of (1757) in Seven Years' War, 7-2.

Hastings, Sir Patrick (1880-1952). Brit. barrister and politician; called to the Bar in 1906; became a K.C. in 1919; Labour M.P. (1922-1926); attorney-general in first Labour govt. in 1924; author of plays, *Scotch Mid.*, *The Blind Goddess*.

Hastings, Warren (1732-1818). Brit. governor-general of India, 4-136, 4-212; Burke and impeachment of, 3-129; and Calcutta, 2-173; Sheridan and, 7-27.

Hastings, William Hastings, Baron (1430-1483). Supporter and friend of Edward IV, beheaded by Richard III, 6-400.

Hastings. Tn. in Sussex, Eng.; pop. (qu. bor. incl. St. Leonards) 65,506; 4-136, 3-402.

Hastings, Battle of (1066), 4-136, 3-270; Bayeux tapestry, 4-389 with illus., 7-451.

Hatch. See *Nautical Terms* (Hst).

Hatcheries, breeding fish in, 3-380.

Hatching. Technique in drawing, 3-125.

Hatching. Incubation period of birds' eggs, 1-460.

Hatfield House, Hatfield, Herts. Seat of the Cecil family; Queen Elizabeth I at, 4-173.

Hathaway, Anne (1550-1623). Wife of William Shakespeare, whom he married in 1582, 7-12, 7-171.

Hathor. Anc. Egyptian goddess, a sky deity; sculpture, 3-184 illus.

Hats and Caps, 4-136 with illus. f.; etiquette of hat-raising, 3-302; "beaver," 1-401; in 14th cent., 2-420.

Hats and Caps, The. Rival political parties in Sweden in 18th cent., 4-137.

Hatshesut (d. 1480 B.C.). Queen of anc. Egypt, 3-198; mortuary temple of, 3-189 illus.; portrait relief, 3-199.

Hat to II (d. A.D. 970). Archbishop of Mainz; according to legend, devoured by mice in the Mouse Tower, nr. Bingen, on Rhine, 6-391.

Haugesund. Tn. in Norway; pop. 18,107, 5-461.

Hauptmann [howp't-man], Gerhard (1852-1916). One of greatest of modern Ger. dramatists; runs the gamut from Zola-like realism to mystic symbolism, 4-14.

Hauraki Gulf, New Zealand, on which is situated the city of Auckland.

Hausas [how'sas]. Negroid race of N. Nigeria, Brit. W. Africa; among most intelligent of Africa; language widely spread through their activity as traders.

Hausmann [ösman'], Georges Eugène, Baron (1809-91). Fr. official, prefect of Seine (1853-70); famous for rebuilding Paris with wide boulevards, 6-79, 6-85.

Hautzsch, Hermann (17th cent.). Ger. clockmaker who built a man-propelled coach, 6-112.

Havana. Cap. of Cuba; pop. 673,370, 4-138, 3-7.

Havasupai. Indian tribe, in Grand Canyon, 4-60.

Havelock, Sir Henry (1795-1857). Brit. soldier; in relief of Lucknow, 4-253, 5-49.

Haverford West. Co. tn. of Pembrokeshire, Wales; pop. 6,134, 6-111.

Havergal, Frances Ridley (1836-79). Brit. hymn writer ("Take my life and let it be").

Havre [ahvr], La. Spt. on coast of Normandy, Fr.; pop. 106,934, 4-138, 5-419, 3-138.

Hawaiian Islands. U.S. territory in the Pacific; area 6,433 sq. m.; cap. Honolulu, 4-139; pineapple plantation, 6-204 illus.

Hawash. r. of S. Abyssinia, 500 m. long.

Hawes Water. Lake in Westmorland, Eng.; 4 m. long; reservoir for Manchester, 4-439.

Hawfinch. Member of the finch tribe; found in thickets, and remarkable for its very large beak adapted for cracking stones of fruits.

Hawick. Tn. in Roxburghshire, Scot.; pop. 16,718, 6-460.

Hawk. Bird, 4-140; types used in hawking, 4-141.

Hawke, Martin Bladen Hawke, 7th Baron (1860-1938). Brit. cricketer. Famous captain of Yorkshire from 1883 to 1910.

Hawker, Harry George (1891-1921). British airman, born in Australia. Rescued in mid-ocean on attempting first cross-Atlantic flight in 1919; killed on practice flight at Hendon.

Hawker Hunter, jet-engined aircraft, 1-44, 4-368 illus.

Hawker Hurricane, R.A.F. fighter of Second World War, 1-35 illus.

Hawking or Falconry, 4-141; Arab falconer, 1-196 illus.

Hawkins, Sir John (1532-95). Eng. seaman, 4-141; and Drake, 3-113; and slave trade, 1-134.

Hawkins, Sir Richard (c. 1562-1622). Eng. admiral, son of Sir John II.; commanded vessel in attack on the Sp. Armada.

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Hawk-moth. Name given to the *Sphingidae* family of moths, found in Gt. Brit.; the Death's Head is one of the species; attraction of honey-suckle, 4-191.

Hawkmoor, Nicholas (1661-1736). Eng. architect; worked so intimately with Wren that it is impossible to make exact division of credit for their work.

Hawkweed. Plant of the family *Compositae*, having yellow flowers.

Hawkwood, Sir John (d. 1394). Eng. soldier of fortune, 6-432.

Ha'worth, Sir W. Norman (1883-1950). British scientist; apptd. prof. of Chemistry, Univ. of Birmingham, in 1925; worked on release of atomic energy; Nobel prize for chemistry in 1937; Royal Medal of Royal Soc. in 1942.

Haworth [how'érth]. Village in Yorkshire, W. Riding, home of Brontë family, 2-91.

Haws. Fruits of hawthorn, 4-142.

Hawser. See *Nautical Terms* (Hst).

Hawser-laid rope, 6-432.

Hawthorn, 4-142.

Hawthorne, Nathaniel (1804-61). Amer. writer, 4-142, 7-364, 2-357.

Hawtrey, Sir Charles (1858-1923). Brit. actor, playwright and theatrical manager; he achieved considerable success in light comedy.

Hay, Ian. Pen-name of John Hay Beith (1876-1952), Brit. novelist and playwright, who achieved great popular success. Works incl. *Pip* (1907), a novel; *Tilly of Bloomsbury* (1919), *Hawtrey* (1936), plays.

Hay, John (1835-1905). Amer. statesman and diplomat; sec. to Pres. Lincoln; sec. of state (1898-1905); negotiated Hay-Pauncefote treaty.

Hay, Will (1888-1949). Brit. "school-master" comedian; famous on film and radio; also as astronomer.

Hay, cattle fodder, 4-64 with illus.

Haydn, Franz Joseph (1732-1809). Austrian composer, 4-142; influence on musical form, 5-305; and development of orchestra, 5-327; and Brit. national anthem, 5-326.

Hayes, Rutherford Richard (1822-93). 19th pres. of U.S.A.; elected pres. by one vote in 1876.

Hayes, r. of Canada, empties into Hudson Bay, 4-200.

Hay fever. Irritation of the mucous membrane of nose and throat caused by pollens of grasses, dust, 1-112.

Hay-Pauncefote Treaty. Negotiated 1901 between U.S.A. and Gt. Brit.; provided for construction of Panama Canal by U.S.A. and its permanent neutralisation.

Hayter, Sir George (1792-1871). Brit. artist, painter of many historical scenes; he was court painter during the reign of Queen Victoria, whose coronation and marriage formed two of his subjects; portrait of Queen Victoria, 7-396 illus. f.

Hayward, Thomas (1871-1939). Professional cricketer, 1893-1914; opening batsman for Surrey co. and Eng.

Hazards, in billiards, 1-445.

Haze. Dispersal of light caused by suspension of fine particles in the air, making it less clear.

Hazel. Deciduous shrub or tree, 4-143; cross pollination, 3-397.

Hazlitt, William (1778-1830). Brit. critic and essayist; whatever his theme, he derives the essence of his commentary from himself, being in turn metaphysician, moralist, humorist, painter of manners and characteristics; friend of Lamb (*Characters of Shakespeare's Plays*; *Table Talk*, 3-290).

Head. See *Architectural Terms*.

Header. See *Architectural Terms*.

Health. See *Hygiene*; *Medicine*.

Health, Ministry of. Dept. of Brit. civil service, establi. 1919; since 1948 responsible for administering National Health Service in Eng. and Wales.

Health Visitor, career as, 2-836.

Healy, Timothy Michael (1855-1931). Gov.-gen. of the Irish Free State (1922-28); entered Parl. 1880; was

HEANOR

private sec. to Parnell, whose leadership he afterwards opposed; advocate of the Land League.

Heanor, Tn. in Derbyshire, Eng. Coal-mining, ironfounding, engineering, pottery, hosiery, lace-making; pop. 24,395.

Hearing, Sense of, ear and brain in, 3-147, 148 with diag.; in insects, 4-284.

Hearn (hærn), Lafcadio (1856-1904). Writer of Eng. books on Japan, unique in combination of truthful insight with literary art (*Kokoro*; *Glimpses of Unfamiliar Japan*; *In (hospitally) Japan*); cosmopolitan, b. Ionian Isls., son of Irish army doctor and Gk. mother; married Japanese and became citizen of Japan.

Hearnst, William Randolph (1863-1951). Amer. capitalist and journalist; owner of "string" of newspapers from San Francisco to New York and of many magazines; chief exponent of sensational journalism.

Heart. Organ of body, 4-143; in anatomy, 1-144; in mammals, 6-100; and pulse, 6-304.

Heart disease, 4-145.

Hearts. Suit in playing cards; and old cup symbol, 2-221.

Heartwood, of trees, 7-313.

Heat. In physics, 4-145; of atmosphere, and humidity, 1-80; and energy, 3-245; measuring heat value of coal, 2-433; focusing heat rays by lens, 4-481; and infra-red rays, 4-260; Joule's researches, 4-384, 385 with illus.; and liquids, 4-520; linen as conductor of, 4-514; in mines, 5-218; and refrigeration, 6-378; from stars, 6-330; of the sun, 7-189; measured by thermometers, 7-267.

Heath. Uncultivated land covered by heather, with pine and birch trees; usually exhibits extremes of dry and wet soil.

Heath (shrub). See **Heather** and **Heath**.

Heathcoat, John (1783-1861). Brit. inventor of steam plough, salt purification process, and lace-making machine, 4-432.

Heather and **Heath**, 4-146 with illus. f.

Heath family or *Ericaceae*. A large family of shrubs and vines, found on poor land, including heaths, cranberries, and rhododendrons.

Heathfield, George Augustus Elliott, Baron (1717-90). Brit. soldier; and -sage of Gibraltar, 4-20.

Heath fritillary, butterfly, 2-141 illus.

Heathrow, Middlesex, site of London Airport, 1-86 with illus.

Heating. Methods of, 4-149; by high frequency currents, 4-174.

Heat Pump, for central heating; how it works, 4-151.

Heaven, Son of. See **Jimmu Tenno**.

Heaviside, Oliver (1850-1925). Brit. scientist specialising in electrical research. Chiefly memorable for establishing existence of ionised layer in upper atmosphere which now bears his name, 6-341. See **Kennelly-Heaviside Layer**.

"Heavy" water. Contains one or more atoms of deuterium, the heavy isotope of hydrogen, per molecule. The deuterium atom contains two protons and an electron in its nucleus instead of single proton of hydrogen atom. Deuterium has chemical properties of hydrogen, since it has only one orbital electron; reactors at Los Alamos, 1-302; in atomic chain-reaction, 1-301, 303, 7-427.

Hebbel, (Christian) Friedrich (1813-63). Ger. poet and dramatist; shows skill in characterisation and true feeling for dramatic situations, but marred by occasional extravagances, 4-14.

Hebburn. Industrial port on F. Tyne, Durham; pop. 23,163; 5-394.

Hebe. In Gk. myth., goddess of youth and joyousness. Since she was cup-bearer to the gods, name is sometimes used jocularly for a waitress; 4-151.

Heber, Reginald (1783-1826). Brit. churchman and hymn-writer, bishop of Calcutta ("Holy, Holy, Holy, Lord God Almighty"; "From

Greenland's Icy Mountains"); 4-226.

Hebrew Language and Literature, 4-151.

Hebrews. See **Jews**.

Hebrews, Epistle to the. The 19th book of the New Testament, a letter addressed to Christians of Hebrew birth, probably those living at Rome, about A.D. 65. The authorship is unknown but frequently attributed to Paul.

Hebrides (hæ'ridéz). Group of more than 500 isls. off w. coast of Scotland; divided by the Minch into the Inner and Outer Hebrides; pop. 55,158; 4-152.

Hebron. Anc. city of Palestine; cave of Machpelah, 6-48 illus.

Hecate (hek'atē), in Gk. myth., goddess of moon, night and magic, 5-259.

Hectare. Unit of area in the metric system, 5-185.

Hector. In Gk. legend, hero of the Trojans, slain by Achilles, 4-152, 7-320.

Hector, Sir. Legendary knight of Arthurian stories, who adopts Arthur as his son; in story, 1-256.

Heddles. Part of loom; in weaving, 5-37.

Hedgehog. Animal, 4-152; hibernation, 4-173; modified hair, 5-100.

Hedge-paraley. Plant, 3-400.

Hedges. Trees and shrubs used for ornament or division between fields and gardens; privets, laurels, and hawthorns are often used.

Hedge Sparrow, or **Acceator**, 7-123; egg, 1-452 illus. f.

Hedin (hæ'din), Sven Anders (1865-1952). Swedish explorer, who travelled to little known areas of cent. Asia including Gobi desert and Tibet; went round the world in 1923.

Hedley, William (1779-1813). Brit. engineer and inventor of a locomotive; "Puffing Billy" (1813), 5-1.

Hedonists (hæ'donists). A school of philosophers believing that pleasure is the chief good, 6-150.

Heel, in human foot, 3-112.

Heel of Achilles. Term for vulnerable point; origin, 1-11.

Heem, Jan de (c. 1600-84). Dutch painter of still life, 6-384.

Heenan, John Carmel (1835-73). U.S. prize-fighter; Sayers fight, 2-30.

Hegel (hæ'gel), Georg Wilhelm Friedrich (1770-1831). Ger. philosopher, founder of the school of absolute idealism; 6-160.

Heidelberg. Tn. of s. Ger. in Land of Baden-Württemberg; pop. 116,488; 4-157.

Heidelberg Man. Type of man existing in prehistoric times, a reconstruction based on a primitive lower jaw found near Heidelberg in 1907.

Heifetz (hi'fetz), Jascha (b. 1901). Rus. violinist; made first public appearance at 5, and before he was 18 had won recognition throughout world as master of violin.

Heilbron, Sir Ian M. (b. 1886). Brit. scientist; prof. of organic chemistry, Univ. of London, Imp. Coll. of Sci., from 1938; scientific adviser to min. of supply 1939-42; won Priestley medal of Amer. Chem. Soc. for synthetic penicillin in 1945.

Heilbronn (hi'l'bron). Industrial tn. in Baden-Württemberg, Ger., on R. Neckar; pop. 60,300. Fine Gothic church and Rathaus.

Heilbronn, League of (1633), formed by Protestants, in the Thirty Years' War, 7-270.

Heimwehr (hi'm'vër). Austrian politico-military organization on fascist lines dissolved in 1936.

Heine, Heinrich (1797-1856). Ger. poet, 4-157, 4-13, 4-373.

Heinkel (hi'n'kel). Series of Ger. aircraft used before and during 2nd World War; He. 111 twin-engined monoplane bomber used in Battle of Britain; later He. 177 heavy bomber and the jet-propelled He. 162; 1-36, 2-78.

Heir Apparent. (a) The next in succession by law to property, which cannot, if he survives the actual holder, pass to anyone but him. (b) Next in descent to the reigning monarch of

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Great Britain, who is bound to succeed to the throne on the death of the latter.

Heir Presumptive. One who at a given moment is actually the next in succession to property or title, but who may at any time cease to be so by the birth of a child nearer to, or more direct in descent from, original ancestor.

Heisenberg (hi'zenberg), Werner (b. 1901). Ger. physicist; created system of quantum mechanics and did research on atomic energy; awarded Nobel prize for physics in 1932; 6-318 with illus.

Hejaz. Part of the kingdom of Saudi Arabia on Red Sea; holy cities of Islam, 1-190.

Hejra. The flight of Mahomet from Mecca (July 16, 622); and Mahomedan calendar, 5-88.

Hekla, Mount. Active volcano in Iceland (5,108 ft.), 4-233.

Helena, St. (d. 328). Mother of Constantine the Great; legendary discoverer of the Holy Cross.

Helena. Cap. of Montana, U.S.A.; pop. 17,498; centre of mining dist.; 5-249.

Helen of Troy. Beautiful wife of Menelaus, King of Sparta, in Homer's *Iliad*, 4-189, 7-320.

Helfrich, Conrad E. L. (b. 1886). Dutch sailor; commanded Netherlands naval forces in E., 1939-42; supreme commdr. Allied naval forces in s.w. Pacific from 1942; c.-in-c. Netherlands and N.E.I. land, air, and sea forces 1942-46. In 1945 represented Netherlands at San Francisco conference.

Heligoland. Same as **Heligoland**.

Helios, in Gk. myth., daughters of Helios, god of the sun; their tears at death of Phaethon turned into amber.

Heliland. (Old Low German poem, c. 830, 4-12).

Helikon (hel'ikon). Anc. name of a peak or mt. range in Boeotia, Greece; on the s. slope were a grove and temple sacred to the Muses.

Helicon. Brass wind-instrument resembling Fr. horn.

Helicopter, 4-157; and "Autogiro", 1-326; and snowed up farms, 7-77.

Heligoland. Ger. isl. in North Sea; area 1 sq. m.; 4-159.

Heliothalus (heli'othalus) or **Elagabalus** (A.D. 205-222). Dissolute Rom. emperor, proclaimed A.D. 218; introduced into Rome worship of Syrian sun-god whose namesake and high priest he was; assassinated.

Heliograph. Signalling device using the sun's rays to transmit messages, 7-52.

Heliopolis (heli'opolis). Anc. city at head of Nile delta, Egypt; once seat of sun-worship; also anc. name of Baalbek, Syria.

Helios. Gk. sun god; Colossus of Rhodes, 7-2.

Heliotrope. Flowering plant of the order *Boraginaceae*; a native of Peru and other warm and temperate climates; has fragrant smell; colour of flowers gives name to purplish colour.

Heliotrope (Gem). See **Stones**, **Precious** (list).

Heliotropism, in plants, 6-216.

Hellum (He). A gaseous element of the inert gas group; atomic weight 4.003; atomic no. 2; 4-160, 3-224; discovery by Ramsey, 3-156, 6-303, 7-127; in air, 1-80, 81; in airships, 4-222, 1-83; identified with alpha-rays, 1-297.

Hell. Dante's conception of, 3-47; Gehenna and; 4-361.

Hel'as. Originally a small dist. in Thessaly ruled by Peleus, father of Achilles; later applied vaguely to all anc. Greece.

Helibore. Name given to various plants of the buttercup family. Garden species include the Christmas rose.

Hellen. Mythical founder of the Greeks, son of Deucalion and Pyrrha, father of Dorus (from whom came Dorians), and grandfather of Ion (Ionians) and

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Achaean (Achaeans); myth probably first current about 8th cent. B.C., when feeling of national unity developed among the Greeks.

Hellenes [hel'enz]. The name of the Greeks for themselves, in anc. and modern times.

Hellenic languages. Sub-group of languages including Gk. and Albanian. 4-445.

Hellenistic Age. In Gk. history; architecture, 1-209; art, 4-01; social conditions, 4-77.

Hellert. Species of tropical aquarium fish, 1-188, 189 illus. f.

Hellepont. Ancient name for Dardanelles, 7-320, 2-49.

Helm. See **Nautical Terms** (list).

Helmet. In armour, 1-243, 244; as protective hat, 4-137.

Helmholtz, Hermann von (1821-94). (Ger. physicist, physiologist, and mathematician; invented the ophthalmoscope; eminent in nearly every other branch of science.

Héloise [helo'e] (c. 1101-61). Wife of Pierre Abélard, 1-3.

Helots. Serfs or slaves of Sparta, 7-124.

Helpmann, Robert Murray (b. 1911). Australian dancer, choreographer, and actor; premier danseur at Sadler's Wells Ballet from 1933; choreographer of *Comus*, *Hamlet*, *Miracle in the Gorbals*, *Adam Zero*; film *Red Shoes*.

Helsingborg or Helsingborg. Spt. and 5th city of Sweden; pop. 66,500; in s. opposite Elsinore, Denmark.

Helsingfors. Swed. name for Helsinki (q.v.).

Helsingör. Danish name for Elsinore (q.v.).

Helsinki. Cap. of Finland, pop. 307,426; 4-160; school of architecture, 3-354; Olympic Games, 5-510.

Helvellyn. Mt. in Lake dist., Eng., 3-113 ff., 4-438.

Helvetian [helv'e-shan] or **Helvetic Republic**. Swiss republic formed by French 1798; lasted until recognition of Swiss independence by Congress of Vienna (1814).

Helvetii [helv'e-shi]. Celtic tribe originally dwelling in what is now s.w. Ger.; later, according to Caesar, they lived in what is now w. Switzerland; Caesar defeated them, 58 B.C.

Helvitiuss, Claude Adrien (1715-71). Fr. philosopher; his most famous book, *De l'Esprit* (Of the Spirit), raised a storm, was condemned by the Sorbonne because of materialistic outlook.

Hemans [h'e-manz], Felicia Dorothea (1793-1835). Brit. poet whose lyrics include popular favourites like "Casabianca" and "The Homes of England".

Hemings, John (c. 1556-1630). Actor of Shakespeare's company. In 1623 with fellow actor Henry Condell, pub. first collected edition of Shakespeare's plays, 7-15.

Hemingway, Ernest (b. 1898). Amer. novelist, 7-365, 366.

Hemiptera (Zool.). Order of insects, including plant-lice or aphides; in classification of insects, 4-270.

Hemisphere. Half of the terrestrial globe or the geographical globe; the former consists of northern and southern (above and below the Equator) and the latter of eastern and western sections (the Old World and the New World).

Hemlock. Poisonous plant, 4-161, 6-236.

Hemlock Dropwort. See **Water Hemlock**.

Hemlock Fir. Tree, 3-356.

Hemming. In sewing, 7-6.

Hemp. Plant, 4-161; rope, 6-151.

Hemy, Charles Napier (1841-1917). Brit. painter of marine subjects.

Hen. Domestic fowl, incubation period of eggs, 1-480. See **Poultry**.

Henbane. A hairy, poisonous plant of the nightshade family; gives the drug hyoscyne; flowers are pale yellowish with purple markings.

Henderson, Arthur (1863-1935). Brit. Labour leader; home sec. in first

Labour govt. (1924); foreign secretary (1929-31); presided over Disarmament Conference (1932-33); Nobel peace prizewinner for 1934; 4-427, 4-464.

Henderson, Sir Neville Meyrick (1882-1942). Brit. diplomat; ambassador in Berlin 1937 to Sept. 1939. Book, *Failure of a Mission*, 1940.

Hendon. Borough of Middlesex; pop. 155,835; 5-27, 5-200; first aero meeting held (1910), 1-39.

Hendren, Elias ("Patsy") (b. 1889). English cricketer. During 1919-1933 regularly scored over 1,000 runs each season. Played for Middlesex and in many Test matches.

Henequen. Msl fibre, 6-493, 7-58.

Hengist and Horsa. Legendary Anglo-Saxon invaders (c. 450); 4-398.

Henlein [hen'lin], Konrad (1901-45). Czech politician and head of Sudeten Germans; in Mar. 1939 was app. civil administrator for Bohemia; June 1939 Reichstatthalter of Sudetenland; committed suicide June 1945.

Henley, William Ernest (1849-1903). Brit. poet, critic, and dramatist; with J. S. Farmer wrote *Dictionary of Swan*; famous lyric, "Invictus".

Henley-on-Thames, Oxfordshire. Tn. on r. Thames famous for its beautiful situation and its annual regatta; pop. 7,970; 6-22.

Henley Royal Regatta. Annual four-day meeting for amateur oarsmen, founded in 1839, chief events at regatta Diamond Sculls and Grand Challenge Cup; 6-459.

Henna. Dried and powdered leaves of the Egyptian privet. Yields yellow and red-gold dyes.

Henner, Jean Jacques (1829-1905). Fr. painter, called "Modern Correggio" because of fondness for soft flesh tints and warm shadows.

Henrietta (1614-70). Brit. princess. Fifth daughter of Charles I. In 1661 she married Philip, Duke of Orleans, and brother of Louis XIV. Came to Dover May 1670 to negotiate secret treaty between Charles II and Louis; died in France on June 30, declaring she had been poisoned.

Henrietta Maria (1609-89). French princess; queen of Charles I of Gr. Brit., 2-306, 4-125; Maryland named after, 6-113.

Henry I, called the Fowler (c. 876-936). German king, 919-936, and Holy Rom. emperor.

Henry IV (1050-1106). (Ger. king and Holy Rom. emp., 4-7; conflict with Pope Gregory VII, 4-96, 4-308.

Henry VI (1155-97). (Ger. king and Holy Rom. emp.; seized throne of Sicily, 7-50.

Henry I (b. 1068; ruled 1100-35). King of Eng., 4-161; archery laws, 1-247; death, 4-441.

Henry II (b. 1133; ruled 1154-89). King of Eng., 4-161; and Becket, 1-402; conquest of Ireland 4-282.

Henry III (b. 1207; ruled 1216-72). King of Eng., 4-162; system of weights and measures, 7-435.

Henry IV (b. 1367; ruled 1399-1413). King of Eng., 4-162; and Richard II, 6-399.

Henry V (b. 1387; ruled 1413-22). King of Eng., 4-162; at Agincourt, 1-68; Hundred Years' War, 4-204.

Henry VI (1421-71; ruled 1422-61). King of Eng., 4-163; portrait, 4-162.

Henry VII (b. 1457; ruled 1485-1509). King of Eng., 4-163; in Wars of the Roses, 6-454; battle of Bosworth Field, 2-23, 6-400; tomb, 6-385 illus.; 3-277; chapel in Westminster Abbey, 7-414 illus.

Henry VIII (b. 1491; ruled 1509-47). King of Eng., 4-163; portrait, 4-164; break with R.C. Church, 2-321; Reformation, 3-277; and Thomas More, 6-262; and Mary Queen of Scots, 6-141; Hampton Court Palace, 4-124; and Mary, 6-140; gold sovereign, 5-235 illus.; and fencing, 3-346; jousting in tournament, 4-417 illus. f.; weights and measures revised, 7-435.

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Henry II (1519-59). King of Fr., 3-450; Brittany united to Fr. crown, 2-91.

Henry IV of Navarre (b. 1553; ruled 1589-1610). King of France, 4-164, 2-450; in Bourbon family, 2-38; Edict of Nantes (1598), 4-202; explorations, 1-136.

Henry. In electricity, the practical unit of self- or mutual-inductance, named after Amer. physicist Joseph Henry. One henry is an inductance such that a rate of change of current of one ampere per second will produce an induced e.m.f. of one volt; 2-216.

Henry, Sir Edward, Bart. (1850-1931). Brit. police official, comm. of Mct. Police, 1903-18; originated filing system of fingerprints, 3-353.

Henry, Joseph (1787-1878). Amer. scientist; developed methods for weather forecasting; and high frequency oscillations, 6-341.

Henry, O., pen-name of William Sydney Porter (1862-1910). Amer. short-story writer (*The Trapped Lamp*, *The Voice of the City*; *Optima*), 7-365.

Henry Esmond. Novel by Thackeray, 7-261.

Henry FitzHenry (1155-83). Second son of Henry II, and subsequently heir to Eng. throne; intrigued against father and died warring against brother Richard; celebrated for knightly exploits.

Henry of Blois (1101-71). Bishop of Winchester and papal legate, brother of King Stephen; quarrelled with latter upon refusal of primacy and for a time supported Matilda's claims to throne.

Henry of Navarre. See **Henry IV**, King of Fr.

Henry the Lion (1129-95). Duke of Saxony and Bavaria, son of Henry the Proud; son-in-law of Henry II of Eng.; by series of wars extended power of his duchies in face of opposition of Hohenstaufen emperors.

Henry the Navigator (1394-1460). Port. prince, son of John I of Portugal. Organized expeditions to explore west coast of Africa, which found the Cape Verde Islands and rediscovered the Azores.

Henryson, Robert (c. 1425-1500). Scot. poet; wrote *Robene and Marion* and the *Testament of Cressid*; 3-241.

Henschel, Sir George (1850-1931). Brit. musical director, composer and singer.

Henson, William (1805-1888). Designed a powered monoplane in 1812, 1-32.

Henty, George Alfred (1842-1902). Brit. writer for boys, first book pub. 1868; 2-356.

Heorot. Hall of King Hrothgar in *Beowulf* story, 1-431.

Hepatica. See **Liverwort**.

Hephaestus [hef'e-stus]. In Gk. myth the smith of the gods; god of fire and the arts and husband of Aphrodite (Venus); he is the Roman Vulcan, 1-10, 7-380.

Hepplewhite, George (d. 1786). Eng. furniture maker, whose delicate graceful chairs were lighter and smaller than Chippendale's and had typically straight, slender legs; his pieces were characterized by simplicity and most refined elegance; 3-491; chair, 3-493 illus.

Heptameron (Gk. "seven days"). Collection of short stories made by various writers at court of Marguerite of Valois (or Navarre); modelled on Boccaccio's *Decameron*; often cynical but important in history of Fr. literature.

Hepworth, Barbara (b. 1903). Brit. sculptor, 6-524.

Hera. In Gk. myth, sister and wife of Zeus (Jupiter); goddess of marriage and fertility; she is the Roman Juno, 7-522, 623 illus. and *Heraclius*, 4-163; peacock sacred to, 6-100; 4-386; and Trojan War, 7-329.

Heraclides, Battle of (280 B.C.). Origin term Pyrrhic victory, 6-314.

Heraclides. See *Heraclius*.

Heraclitus [heraklit'us] (c. 540-475 B.C.). Gk. philosopher, called founder

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of metaphysics; taught that constant change from being to not being is fundamental principle of universe; sometimes called the Weeping Philosopher; 3-357, 6-160.

Heraclius [herak'li'us] (c. 575-642). A Byzantine emperor; defeated Chosroes II, emperor of Persia, 6-131.

Heraklion (Crete). See **Candia**.

Herald. A public official who, in ancient times, conveyed challenges to battle, proclaimed war or peace, etc.; in modern times the three Kings of Arms, six heralds, and four Pursuivants are responsible for proclaiming a new sovereign, 4-165.

Heraldry, 4-164; language and grammar of, 4-164 illus. f.; Shakespeare's coat of arms, 7-12 illus.

Heralds' College. See **College of Arms**.
Hera't [heraht']. Fortified city in w. Afghanistan, of strategic importance; pop. 75,600; caravan centre; once important city, cap. of Turkestan's empire.

Herbarium. Garden of monastery where medicinal herbs were grown; also name given to a collection of pressed flowers; 5-244, 2-453, 2-24.

Herbart, Johann Friedrich (1776-1841). Ger. philosopher, psychologist and educator, 6-160.

Herbert, Sir Alan (b. 1890). Brit. author, wit, and politician; M.P. 1935-50; introduced new divorce legislation; pub. volumes of light sketches, witty, satirical and topical verse, and attacks on the misuse of English. Wrote novels, and libretti for light operas and revues.

Herbert, George (1593-1633). Eng. poet, saintly pastor of Bemerton. *The Temple* is full of quaint artificialities, but contains some of the most treasured Eng. sacred lyrics, e.g. "Let all the world in every corner sing."

Herbivorous animals. Those adapted to vegetable food; include ruminants.
Herb Robert. Hardy annual plant, height 2-3 ft., flowers pale purple. Leaves have disagreeable smell when bruised, 3-524.

Herculaneum. Anc. Rom. city buried by eruption of Mt. Vesuvius A.D. 79; excavations, 6-258.

Hercules or Heracles. Hero in Gk. and Rom. myth., 4-165; and Amazons, 1-150; and the hydra, 4-213.

Hercules, constellation, 1-281.

Hercules, Pillars of. Rocks on each side of the strait of Gibraltar; and Hercules myth., 4-166.

Hercules beetle, 1-415, 413 illus.

Herd, Sandy (Alexander) (1868-1944). Scot. golfer; won open championship in 1902 and came second four times, 4-44.

Herder, Johann Gottfried (1744-1803). Ger. critic and poet, 4-13.

Heredity. Transmission of qualities from parents to offspring, 4-166; Mendel's laws, 5-168.

Hereford. Co. tn. and cath. city of Herefordshire, Eng.; pop. 32,490; 4-169; floods, 3-391 illus.

Hereford cattle, bull, 2-271, 275 illus.
Herefordshire. Co. of Eng.; 842 sq. m.; pop. 127,000; co. tn. Hereford; 4-168.

Herero [hara'rō]. A Bantu people of South-West Africa; chief occupation cattle-raising, 1-51.

Heresy. Opinion contrary to established religion, or religious authority; infraction and, 4-263.

Hereward the Wake (11th cent.). Eng. hero, 4-169; and Ely, 3-237, 7-451.

Hergesheimer, Joseph (1880-1954). American novelist; psychological studies with complex social backgrounds (*The Three Black Pennies*; *Jana Head*; *Cytherea*; *Swords and Poses*); 7-365.

Heriot, George (1563-1624). Scot. philanthropist and jeweller to James VI of Scotland; founded Heriot's hospital and school, Edinburgh, 3-184.

Herkomer, Sir Hubert von (1849-1914). Naturalised Brit. artist, b. in Bavaria; won speedy success as a portrait and subject painter; R.A. in 1890.

Hermanaric. See **Ermanaric**.

Hermann or Arminius the Cheruscan (17 B.C.-A.D. 21). Ger. chief; defeat of Rom. legions, 4-5.

Hermes. Gk. god, identified with Mercury, 5-173; Praxiteles statue, 4-85 illus.; and Perseus, 6-128.

Hermes Trismegistus ("Hermes the thrice greatest"). Gk. name of Eg. god Thoth; reputed author of Hermetic Books, encyclopedic works on Eg. religion, art, and science.

Hermit. Precursor of monks, 5-213.
Hermitage, The. Museum in Leningrad, Russia, 4-479.

Hermit Crab, 2-523 with illus.

Hermion, Mount. Highest peak in Lebanon, 9,830 ft., 4-472.

Hermopolis Parva (anc. city). See **Damanhur**.

Hernandez, Gregorio (c. 1576-1636). Span. sculptor, 7-112.

Herne Bay. Tn and holiday resort in Kent, Eng.; pop. 18,298; 4-398.

Hero of Alexandria (c. 150 B.C.-A.D. 200). Gk. mathematician and writer on mechanical and physical subjects; primitive jet engine, 4-370.

Hero and Leander. Gk. legend, 4-170.

Herod. Name of several rulers of Palestine; see below.

Herod (the Great); 74-4 B.C.). King of Judea 37-4 B.C.; grandson of Herod Antipas; made King of Judea by Antony and Octavian; he governed Palestine on behalf of Rome, 4-170.

Herod Antipas. Tetrarch of Galilee and Peraea, 4 B.C.-A.D. 39; son of Herod the Great; the Herod of the Salome story, Mark vi, 17-29; 4-170.

Herodias [herō'dias]. Wife of Herod Antipas, mother of Salome, and instigator of the beheading of John the Baptist, 4-170.

Herodotus (c. 480 B.C.-c. 425 B.C.). Gk. historian, 4-170, 4-93, 4-181; account of Babylon, 1-336; on the Pyramids, 6-313, 3-184; board, 1-397 illus.

Heroes, The (1856). Collection of legends of Greece and Rome re-written by Charles Kingsley, 4-409.

Heroic couplet, in poetry. Pope's use of, 6-258, 6-234, 3-247.

Heroin. Drug derived from morphine.

Hérod, Louis Joseph Ferdinand (1791-1833). Fr. composer, 5-514.

Heron. Wading bird, related to stork and ibis, 4-170; egg, 1-452 illus. f.; migration, 5-204 illus. f.; 7-166 illus. f.

Herophilus (c. 300 B.C.). Gk. anatomist at the Gk. school of physicians, Alexandria, 5-161.

Herostratus [herō'stratus] (4th cent. B.C.). Ephesian who set fire to Diana's temple.

Héroult, Paul Louis Toussaint (1863-1914). Fr. chemist and metallurgist; patented process for mfg. of aluminium, 1-128.

Herrera, Juan (c. 1530-97). Span. architect who built the Escorial, 7-112, 114 illus.

Herrera architecture, in Spain, named after Juan Herrera (q.v.).

Herriot, Robert (1591-1674). Eng. lyric poet; regarded by Swinburn as the greatest of Eng. song writers; "Corinna's Maying," "Night Piece to Julia," "Gather Ye Rosebuds," and other delicate, "juvenile, unimpassioned verse, 3-285.

Herring and Family, 4-171; fisheries, 3-380; herring net, 3-376 illus. See also **Fish** (list).

Herringbone, in sewing, 7-7.

Herringbone, on skis, 7-61 illus., 62.

Herring gull. Bird, 4-107, 106 illus.; egg, 1-452 illus. f.

Herriot [er'riō], Édouard (b. 1872). French statesman; prime minister 1924-5-6; afterwards pres. of chamber of deputies; imprisoned in Germany 1944-45; apptd. chairman of the Five-Power (Western Union) committee, and member of European Unity committee, 1948.

Herschel [hēr'shel], Caroline (1750-1848). Brit. astronomer, b. Ger., assistant of Sir William Herschel.

Herschel, Sir John Frederick William (1792-1871). Brit. astronomer, son

HEVER CASTLE

of Sir William Herschel; discovered 525 star clusters and nebulae not recorded by his father, 5-361; made first telescopic survey of southern heavens; invented a process of photography on sensitised paper.

Herschel, Sir William (1738-1822). Brit. astronomer, b. Ger.; developed study of fixed stars and discovered 3,000 star clusters; proved motion of solar system through space; discovered planet Uranus, 7-370; and nebulae, 5-361.

Herschel, Sir William (1833-1917). Brit. official, son of Sir J. F. W. Herschel and grandson of Sir William Herschel; inventor of system of fingerprints, print identification, 3-353.

Hertford. Co. tn. of Hertfordshire, Eng.; pop. 13,890; 4-172.

Hertford College, Oxford univ.; foundation, 6-18.

Hertfordshire [hār'ford'shēr]. Co. of Eng.; area 632 sq. m.; pop. 609,730; co. town Hertford; 4-172.

Hertz [hārtz], Gustav (b. 1847). Ger. physicist, son of Heinrich Hertz; with J. Franck, carried out experiments on the emission of spectral lines caused by electronic bombardment, which led to the proof of the quantum theory.

Hertz, Heinrich Rudolph (1857-94). Ger. physicist. Discoverer of the Hertzian waves, basis of all radio communication, 6-311; confirmed Maxwell's theory, 5-150; and Kelym, 4-390; Hertzian resonator, 5-122.

Hertzog, James Barry (1866-1942). S. African statesman, 7-92.

Hervey Archipelago. See **Cook Islands**.

Herzegovina. See **Bosnia and Herzegovina**.

Herzen [hēr'tsen], Alexander (1812-70). Rus. author and publicist, whose political writings, secretly circulated in Russia, stirred up revolt against Rus. absolutism.

Herzl, Theodor (1860-1904). Jewish journalist; and foundation of the Zionist Organization (1897), 4-302.

Heseltine, Philip. See **Warlock, Peter**.

Hesiod (8th cent. B.C.). Gk. poet; a farmer, he wrote a didactic poem on agriculture which influenced Virgil, 4-93, 3-17.

Hesperides. In Gk. myth. daughters of Atlas who guarded the golden apples of Hesperides, 4-166.

Hess, Rudolf (b. 1891). Leading Ger. Nazi deputy to Hitler. Flew to England May 1941, held prisoner. Tried at Nuremberg, 1945-46 and sentenced to life imprisonment.

Hess, Victor F. (b. 1883). Austro-American physicist; researches on cosmic rays won him the Nobel prize for physics 1936.

Hesse [hes'sē]. Former grand duchy incorporated in Land of Hesse, 1946.

Hesse-Cassel or Electoral Hesse. Former Ger. grand duchy and electorate n. of Hesse-Darmstadt; joined Austria in Austro-Prussian War (1866); incorp. with Prussia in 1866.

Hesse-Darmstadt. Name of Hesse until 1866.

Hessen. Land of W. Germany; area 8,150 sq. m.; pop. 4,323,800; cap. Wiesbaden; covers former grand duchy of Hesse and prov. of Hesse-Nassau; 4-3.

Hessian Fly. One of the worst pests of Amer. farms, doing many millions of pounds' worth of damage to grain in a year.

Hestia. Gk. goddess of hearth and home; daughter of Cronos; same as Rom. Vesta.

Heaton, Borough (with Isleworth) of Middlesex, 12 m. w. of London; pop. 106,836; 5-200.

Heuss [hois], Theodor (b. 1884). 1st pres. W. Ger. Fed. Repub., Sept. 1949; 4-12.

Hevea brasiliensis. Rubber tree of Brazil; seedlings transplanted to Ceylon, 1-272.

Hevelius, Johann (1611-87). Ger. astronomer; and periscope, 6-125.

Hever Castle, nr. Etonbridge, Kent. Historic 15th cent. castle built by

HEVESY

Sir Geoffrey Boleyn. Anne Boleyn lived here; 4-398.

Havassy, George von (b. 1885). Hungarian chemist and physicist; with D. Coster discovered the element hafnium in 1922; introduced application of isotopes as indicators or tracers in chemistry and biology.

Hawlett, Maurice Henry (1861-1923). Brit. romantic novelist; *Forest Lovers*; *Richard Yea and Nay*; *The Queen's Quair*.

Hexameter. Metre of the *Iliad* and the *Odyssey*, 6-234.

Hexapoda or Insecta. The class of six-legged arthropods, or insects.

Hexham. Market tn. in N. Eng. on r. Tyne, 20 m. w. of Newcastle; here Yorkists defeated Lancastrians in 1464; pop. 8,888; ironworks, coal mining; trade in agricultural products; fine priory church (abbey).

Hexuronic Acid. A carbohydrate; pure form of vitamin C.

Heyden, Jan van der (1637-1712). Dutch painter, 6-384.

Heydrich (Hl'drich), Reinhard (1901-42). Ger. Nazi police officer; in 1935 chief of Gestapo; tried for terrorism and murder to stamp out resistance in Norway, Netherlands, Bohemia and Moravia; died as result of bomb thrown May 1942, in Prague.

Heye Foundation. Museum (2 million exhibits), research labs., and library completed 1922 in New York, for anthropological, etc., study of the American Indian; founded in 1920 by Dr. G. G. Heye (b. 1874).

Heyerdahl, Thor (b. 1914). Norwegian anthropologist and navigator; *Kon-Tiki* expedition, 6-28.

Heyse (Hize), Paul (1830-1914). Ger. poet, novelist, and short-story writer; Nobel prize-winner (1910); master of the novelette; his stories usually consist of one incident polished and worked over till it stands out like a cameo; a pessimistic but progressive, radical thinker.

Heysham (Hesham), in bor. of Morecambe and Heysham, Lancs., Eng.; harbour and steamship service to N. Ireland.

Hosekiah (8th-7th cents. B.C.). Strong righteous king of Judah; defeat of Sennacherib, 4-374.

Hiawatha. Poem by Longfellow; story retold, 4-35.

Hibernation, 4-173; of bats, 1-382; of bears, 1-390; of hedgehogs, 4-152.

Hibernia (Hibernia). Anc. Latin and poetical name of Ireland.

Hibiscus. A large genus of plants of the mallow family, natives of warm climates, many with large flowers; fibres used in the East for cordage and matting.

Hiekman, Henry Hill (1800-1830). Brit. doctor who used carbon dioxide as an anesthetic, 1-142.

Hickory. N. Amer. tree of the walnut family; nuts (known as pecan-nuts) are sweet and tasty, and the wood is used for making handles for axes, picks, and other tools.

Hicks, Sir (Edward) Seymour (1871-1949). Brit. comedy actor, married Ellaline Terriss, with whom he often acted; for several years leading actor in Gaiety Theatre musical comedies (*Sporting Life*, *The Catch of the Season*, *Vintage Wine*).

Hidalgo, Mexico. State in cent. part; 8,000 sq. m.; pop. 771,820; cap. Pachuca; mining, textiles.

Hidalgo y Costilla, Miguel (1753-1811). Mexican patriot priest, venerated as a saint, led revolt in 1810, 5-188.

Hides, for leather; compared with skins, 4-466.

"Hiduminium." Trade name for an aluminium-based light alloy, 1-116.

Hieratic. A simplified cursive form of Egyptian hieroglyphic writing used by priests, 2-43, 2-1-120 illus.

Hieroglyphics, 4-174, 3-183, 1-120 illus.; discovery of Rosetta Stone, 6-454.

High Brown Fritillary, butterfly, 2-139 illus.

High Commissioners. Representatives

of ambassadorial status exchanged by British Commonwealth countries, 1-131.

High Courts of Justice, Strand, London. Eng. courts of law, divided into three groups—Chancery; Queen's Bench; and Probate, Divorce and Admiralty; bankruptcy and the winding up of companies are treated in separate courts, but under the Queen's Bench division, 2-321.

Highest Common Factor, in arithmetic; how to determine, 3-336.

High Flying, in aircraft; advantages of, 4-371.

High-Frequency Currents, 4-174.

High German. Language, 4-12.

Highland or Kyle Cattle, 2-274, 275 illus.

Highland Fling. Dance, 3-38 illus.

Highland Light Infantry. Regimental pipers, 1-347 illus. f.

Highlands of Scot. That part of Scot. N. of the Grampians; Breadalbane range, 6-513 illus. f.; clans, 2-406; grouse-shooting, 6-510.

High Seas. Ocean waters 3 m. or more from shore not included in territorial limits of any nation.

High-speed Photography, 6-172, 180 illus.

High Street. Mt. in Lake dist., Eng., 2,718 ft., 4-438.

Highway Code. A code prepared by the ministry of transport for the instruction of all users of the Queen's highway, whether pedestrians or drivers of vehicles.

Highwaymen, 4-175.

High Willhays. Eng. Highest point of Dartmoor, Devon; 2,039 ft.

High Wycombe. Tn. in Bucks, Eng. furniture industry; pop. 40,690; 2-105.

Hilary (Hilarus). Bishop of Arles (403-449), organized his cathedral clergy into a band of workers devoted to social exercises of religion; he had a high reputation for piety and learning, wrote various works, and the poem *De Providentia* is attributed to him.

Hilary (Hilary). Bishop of Poitiers (c. 300-367); ranks highest among Latin writers of 4th cent.; treatise on the Trinity; called the "Hammer of the Arians" for his labours against Arianism.

Hilda or Hild, St. (614-680). Eng. abbess, descendant of royal Northumbrian line; founded monastery of Whitby; and Caedmon, 2-159.

Hildebrand. Pope. See Gregory VII.

Hill, David Octavius (1802-70). Brit. painter and pioneer of photography; camera portrait by, 6-175 illus.

Hill, Sir Rowland (1795-1879). Brit. postal reformer who introduced uniform penny postage prepaid by use of adhesive penny stamp, 6-270, 7-143.

Hillary, Sir Edmund (b. 1919), K.B.E. N.Z. bee-keeper and mountaineer, who with the Sherpa Tensing Norkey reached summit of Mt. Everest, May 29, 1953, 3-321.

Hillary, Sir William (1771-1847). British founder of Royal National Life-Boat Institution (1824), 4-193.

Hilliard, Nicholas (1547-1618). Eng. artist; goldsmith, carver and limner to Queen Elizabeth I; miniaturist, 3-258.

Hilton, James (1900-54). Brit. author. Novels include *Lost Horizon*, awarded Hawthornden Prize (1934); *Goodbye, Mr. Chips*; *Random Harvest*.

Hilversum. Tn. and holiday resort of Netherlands; site of principal Dutch broadcasting station. Pop. 87,150.

Himachal Union. State of the Rep. of India, an amalgamation of 21 former Punjab hill states. Admin. by cent. govt.; cap. Simla; area 10,800 sq. m.; pop. 989,437; 4-241.

Himalaya Mountains, 4-176, 1-264; Everest, 3-319-21. Mt. Godwin-Austen or K2, climbed 1954 by two members of Italian expedition.

Himalayan Bear, 1-392.

Himalayan Blue Pine. Species of pine, 6-204.

Himalayan Cedar. See Deodar.

HIRAM

Himation [hima'tion]. Gk. garment.

Himmeler, Heinrich (1800-45). Chief of Ger. Gestapo, 6-252; committed suicide after capture May 1945.

Himemara (c. 805-882). Archbishop of Reims; ecclesiastical and political leader in West Frankish kingdom.

Hind, or doe. Female deer, 3-59.

Hindemith, Paul (b. 1895). Ger. composer; earlier works ultra-modern later compositions more classical. Influence in U.S.A., 5-306.

Hindenburg, Paul von (1847-1934). Ger. soldier and pres. of Ger. Republic; in 1st World War, he stopped the Russian advance at Tannenberg; took chief command of Ger. armies on w. front Aug. 1916, establishing the "Hindenburg line" of defences. President, 1925-34, 4-10, 7-479, 450, 7-482.

Hindenburg. German airship, built 1936, 1-84; explosion of, 4-221 illus.

"Hindenburg Line." A strong defensive zone of trenches and strong points constructed by the Ger. army in 1916, between Arras and the Chemin des Dames.

Hindi. A debased version of Sanskrit (q.v.), proclaimed the official language of India in 1950; 4-241.

Hindmarsh, Sir John (d. 1860). Brit. sailor; first gov. of S. Australia, 7-102.

Hinduism. System of religious beliefs and social customs, 4-178; and Benares, 1-427; caste system, 4-242; cow as sacred animal, 4-241 illus.; banyan tree sacred to Hindus, 1-365; Ram Lilla, 4-241 illus. f.; no. of Hindus, 4-251, conquest of Java, 4-355; mythology, 5-312; status of wives, 4-135.

Hindu Kush. Mts. in S. Pakistan and Afghanistan, 1-261, 6-44; Khyber Pass through, 1-46.

Hindustani. Persian name, meaning "land of the Hindus," for land N. of Vindhya Mts., or upper basin of Ganges.

Hindustani. Spoken common language of N. India and Pakistan; c. half Hindi, mixed with Persian, Arabic, Turkish, etc. Its written form is Urdu, 4-241.

Hinkler, Herbert John Louis (1892-1933). Australian aviator; flew in 1st World War, and afterwards a test pilot; in 1928 flew to Australia in a light plane in 15 days; lost on a similar flight in 1933; 1-42, 4-379.

Hinnom, Valley of. See Gehenna.

Hinsley, Arthur (1865-1943). Roman Catholic Archbishop of Westminster from 1935; created a cardinal in 1937.

Hipparchus (fl. c. 146-126 B.C.). Gk. astronomer and mathematician; was founder of trigonometry; also discovered precession of the equinoxes (q.v.) and invented method of fixing terrestrial positions by circles of latitude and longitude, thereby founding scientific geography; 2-491.

Hip'per, Franz von (1863-1932). Ger. admiral in command at battle of Jutland.

Hippocrates [hipok'rates] (c. 460-377 B.C.). Famous Gk. physician, called "father of medicine"; first to dissociate medicine from superstition and to insist on scientific study of disease, 4-179, 7-194, 3-45.

Hippocratic Oath, sworn by doctors on entering their profession, 4-179-1-45.

Hippocratic School of medicine, 5-161.

Hippodamia. In Gk. legend wife of King Pirithous, and centaurs, 2-291.

Hippodrome. Course for chariot or horse racing in anc. Greece; in Constantinople, 2-150.

Hippoglossus. See Halibut.

Hippolyta. Queen of the Amazons; wore famous girdle given her by father, Ares; killed by Hercules, 4-166, 1-130.

Hippopotamus, 4-179, 180, 181 illus. f. 1-56 with illus. f. hair, 5-100.

Ivory from teeth, 4-331.

Hiram. King of Tyre about 1000 B.C. contemporary of David and Solomon.

HIROHITO

raised Tyre to leading position in Phoenician Confederacy.

Hirohito [hērōh'tō] (b. 1901). Emperor of Japan from 1926; renounced belief in own divinity and became a secular and constitutional monarch in 1945.

Hiroshige (1797-1858). Jap. artist and colour engraver; Full Moon on Kanazawa, 4-352 illus.

Hiroshima [hērō'shima]. Port at s. end of Honshu Isl., Japan. First atom bomb dropped by U.S. air force, Aug. 6, 1945, and greater part of city destroyed, 1-303, 4-350, 7-498.

Hirst, George (1871-1934). Eng. cricketer; in 1906 scored over 2,000 runs, took 208 wickets; played for Yorks 1892-1920.

Hispania [hispā'nia]. Rom. name for Sp. peninsula.

Hispaniola ("Little Spain"). Name given by Columbus to the second largest island of the West Indies, now also known as Santo Domingo and Haiti and occupied by the two independent republics of Santo Domingo (Dominican Republic) and Haiti, 3-106. See also Dominican Republic; Haiti.

Hispano anti-aircraft gun, 1-171.

Hisarlik, Hill of. Site in Asia Minor where for centuries Troy lay buried, 7-319.

Histamine. Chemical produced in the cells of the body as result of shock or by the action of substances such as pollen, white of egg, etc., on persons allergic to them; by contracting plain muscle and dilating capillaries it is immediate cause of allergic diseases.

Histia flabellicornis. Moth, 2-143 illus.

Histology. Founded by Theodore Schwann, 7-327.

History. The record of past events, 4-160; archaeology, 1-203; and biography, 1-146; Herodotus' method, 4-170; Macaulay as historian, 5-58; Middle Ages, 5-198. See also separate countries and charts in Study Outlines.

Hitch, a type of knot, 4-422.

Hitler, Adolf (1889-1945). Ger. dictator, 4-181, 4-10, 7-485-486 with illus., 7-196; and National Socialism, 5-328; and Nuremberg, 5-476; and Poland, 6-210.

Hitler Youth Movement, 5-329.

Hittites. Anc. people of Asia Minor similar in appearance to Hebrews. Built up an empire lasting from about 2000 B.C. to 717 B.C. An agricultural people; bred and domesticated horses; 3-200.

Hittite. Dead language of Syria, 4-145.

Hizen Ware. Type of Jap. pottery, 4-351.

Hoar Frost, why it forms, 3-477.

Hobart. Cap. of Tasmania; pop. 87,120, 4-183, 7-229.

Hobbema, Meindert (1638-1709). Dutch painter, 5-384; The Avenue, Middelhamis, 5-390 illus.

Hobbes, Thomas (1588-1679). Eng. philosopher; developed his theory of sovereignty in a book called *Leviathan*, in which he regards the state as a monster composed of men; 6-160.

Hobbs, Sir John Berry (b. 1882). Eng. professional cricketer, played for England 1907-30; opening bat for Surrey; surpassed W. G. Grace's record of 126 centuries in first-class cricket in 1925, when he scored 16 centuries in one season; in 1930, beat Grace's aggregate record of 54,896; knighted 1933.

Hobby. Bird; a kind of falcon, 4-141.

Hoboken, New Jersey, U.S.A.. Port of entry, rly, and industrial centre opposite New York City on Hudson R.; 5-398.

Hobson's Choice. Expression used to signify "this or nothing"; arose from fact that Thomas Hobson (1544-1630), a stablekeeper of Cambridge told customers they could have any horse they liked, but in practice insisted upon the hiring of the horse nearest the door.

Ho Chi-minh (b. 1892). Leader of rebel party, Vietnam, in Vietnam, Indo-China, 7-400.

Hochkirch [hōkh'kērk], Ger. VII. 35 m. N.E. of Dresden where Austrians defeated Prussians under Frederick the Great in 1758; 7-2.

Hochstadt [hōkh'shtat], Ger. Tn. in Bavaria on Danube 60 m. N.W. of Munich; battle of Blenheim (1704).

Hook, of horse, 4-196 diag.

Hook. Ger. white wine, produced in Rhine valley and locally known as Hochheimer. Anglicised name hook is applied generally to all Rhine white wines.

Hockey. An outdoor sport, 4-183; hurling compared with, 4-210.

Hockey-stick, 4-181; ice-hockey, 4-232.

Hooking, Joseph (1855-1937). Brit. author and Nonconformist minister; among his numerous novels are *Jabez Easterbrook*; *All Men are Liars*; *Let Us Forget*; *The Sword of the Lord*.

Hooking, Silas Kitto (1850-1935). Brit. novelist, brother of Joseph Hooking; for many years a Nonconformist minister; most of his numerous novels have a religious interest.

Hooktide. Old Eng. holiday, 12th-18th cent., observed on second Monday and Tuesday after Easter and supposed to commemorate Saxon victories over Danes.

Hodeida [hōdē'idā]. Fortified spt. of Yemen, Arabia, on Red Sea; pop. 35,000; centre of coffee trade.

Hodja, or Hoxha, Enver Ahmed (b. 1908). Pres. of Albanian Republic from 1946; head of guerrilla forces in 1942, and organized resistance movement which freed Albania; in 1941 pres. of provisional govt., 1-92.

Hodler, Ferdinand (1853-1918). Swiss painter; figure subjects, allegories, historical paintings; strong, powerful line and fine colour.

Hoe, Richard March (1812-86). Amer. manufacturer and inventor; with his brothers Peter and Robert developed the web perfecting press; their rotary press revolutionised newspaper printing; improved machines printed both sides of the sheet, and cut and folded it.

Hoel, King of Armorica in Celtic legend; aids King Arthur, 1-256.

Hoenir [hō'nēr]. In Norse myth., god who with Odin and Loder created first men, Ask and Embla, from trees in Midgard; from Odin they obtained life, from Hoenir mind, and from Loder blood.

Hofer, Andreas (1767-1810). Tirolese patriot and popular hero, leader of insurrection against Bavaria and France; betrayed, court-martialed and shot; monument at Innsbruck, 4-263.

Hoffmann, Erdst Theodor Amadeus (1776-1822). Ger. novelist, leader in romantic movement; *The Devil's Elixir* is his most famous novel; 4-13.

Hofmann, August Wilhelm von (1818-92). Ger. chemist and teacher whose work helped to found Ger. coal-tar industry; discovered benzol (benzene) in coal-tar.

Hofmann, Josef (b. 18). Polish pianist; an infant prodigy at six, made a successful concert tour of Europe at nine; in his mature years had few rivals as an interpreter and as a technician.

Hofmannsthal [hōf'mahnstahl], Hugo von (1874-1929). Austrian neo-romantic dramatist and poet; *The Death of Titian*; *Elektra* and *The Rose Cavalier* used as libretti for operas by Richard Strauss; 4-14.

Hofuf. Tn. in Saudi Arabia; pop. 30,000, 1-190.

Ho'garth, David George (1862-1927). Brit. archaeologist; excavated in Cyprus, Egypt, Syria, Greece, Crete, etc.; writings include *Wandering Scholar in the Levant*.

Hogarth, William (1697-1764). Eng. painter, 4-184; as an anecdotal

HOLBORN VIADUCT

artist, 3-263; portraiture, 3-259; demonstrated errors in perspective, 6-137 illus.; An Election, 3-208 illus.; The Shrimp Girl, 3-265 illus.

Hogben, Lancelot (b. 1895). Brit. biologist; held chairs of social biology, natural history, zoology, and medical statistics at univ. of London, Aberdeen, and Birmingham. Works include *Mathematics for the Million*, *Science for the Citizen*.

Hogg, James (1770-1835). The "Ettrick Shepherd," Scottish peasant poet, helped Scott to collect his Border Minstrelsy (*Scottish Fables*; *The Mountain Bard*; *The Queen's Wake*); 6-514.

Hogg, Quintin (1845-1903). Brit. phil.-anthropist, best known as founder of the original Polytechnic. See Polytechnic.

Hogmanay [hog'manā]. Scot. New Year's Eve festival; "first footing" or being the first to enter another's house at midnight, is a part of the celebrations.

Högronden. Mt. in Norway (6,920 ft.), 5-462.

Hog's Back. W. end of N. Downs in Surrey, Eng., so-called from its shape. Lies between Guildford and Farnham (10 m.), 350-500 ft. high with main road running length of crest. Magnificent views.

Hogshead. Liquid measure equivalent to 54 gallons. Also a cask or barrel, of variable capacity, for sugar, tobacco or molasses. In U.S.A. a hogshead is a barrel holding 140 gallons.

Hohenfriedberg [hō'enfrē'debārg]. Poland. Small tn. Silesia, 36 m. S.W. of Breslau; ceded by Ger. 1845; scene of victory of Frederick the Great (1745) in War of Austrian Succession.

Hohenheim, Theophrastus Bombast von. See Paracelsus.

Hohenlinden [hō'enlīn'den], Ger. VII. in Upper Bavaria, 19 m. E. of Munich; Fr. gained victory over Austrians in 1800; 5-319.

Hohenstaufen [hō'enstāufen]. A noble Ger. family of Middle Ages; the castle from which the family took its name was in Swabia; Frederick Barbarossa was a member; 4-7.

Hohenzollern [hō'enztō'ern]. A noble Ger. family; the castle from which it took its name was in Swabia, near the Danube; family name of kings of Prussia.

Hohe Tauern. A division of the Eastern Alps; name also applied to a particular summit (8,080 ft.) lying S. of Hof-Gasteln.

Hokey-pokey. Kind of ice-cream, 4-232.

Hokkaido [hōkkī'dō], or Yezo. Most northerly large Isl. of Japan; with adjacent islands, 34,276 sq. m.; 4-340; map, 4-341.

Hokusai [hō'koosai], Katsushika (1760-1849). Japanese artist of popular school; on his deathbed at 89 he mourned that he had not lived long enough to become a great artist; strongly influenced modern art; remarkable for his industry; 30,000 drawings known to be his; colour-print, 4-353 illus. f.

Holbein [hōl'bīn], Hans, the Elder (c. 1465-1524). Ger. painter, best known for the Basilica of St. Paul and a Passion in 11 scenes; later work shows it. influence on his original Flemish technique.

Holbein, Hans, the Younger (1497-1543). Ger. painter, 4-185, 3-250; portrait of Henry VIII, 4-184 illus.; Sir Thomas More, 3-124 illus.

Holberg, Ludvig, Baron (1684-1754). Norwegian-Danish dramatist, historian, and philosopher; made Danish a literary language; had vast influence over his countrymen (*Subterranean Journey of Niels Klim*); 5-467.

Holborn [hō'bōrn]. Met. bor. in cent. part of London; pop. 24,806; contains Lincoln's Inn and Gray's Inn and British Museum.

Holborn Viaduct, Holborn, London. Erected by the City Corporation in

HOLDEN

1863-69 to avoid the steep gradient of Holborn Hill, and generally to improve this main thoroughfare between the City and the West End.

Holden, Sir Charles (b. 1875). Brit. architect; gold medalist, R.I.B.A.; vice-president Architectural Assn.; works include new London University buildings, and head offices London Transport Executive, 1-218.

Holger-Nielsen method, of artificial respiration, 3-387 with illus.

Holguin. Tn. of Cuba; pop. 171,907; 3-7.

Holiday Camp, 2-192.

Holidays, 4-166.

Hollinshed or Hollingshead, Raphael (c. 1520-80). Eng. chronicler, compiler of *Chronicles of England, Scotland, and Ireland*; source book of Eliz. dramatists; Shakespeare's use of, 7-14, 3-285.

Holland, Sidney G. (b. 1893). New Zealand politician. Became prime min. and min. of finance in 1949 (created C.B. in 1951).

Holland. Eng. name for the Netherlands; also two provinces of Netherland, N. and S. Holland, 4-187, 7-454.

Holland. One of the three parts of Linco, Eng., admin. from Boston 4-512.

Hollandia. Cap. of Netherlands New Guinea; pop. 10,000; 5-396.

Hollands Gin. A name for Dutch gin, or Geneva spirit, 7-136.

Hollar, Wenceslaus (1607-77). Bohemian engraver; worked chiefly in England and was drawing-master to Charles II.; his views of London are notably fine.

Hollental (Valley of Holl), Bavaria 1-389 illus. f.

Hollerith, Herman. Amer. inventor of punched card machine, 2-169.

Holles, Denzil, 1st Baron (1599-1680). Eng. parliamentary leader active in opposing Stuart autocracy; imprisoned in 1629; helped Pym to draw up Grand Remonstrance; participated in Civil War but opposed Oliver Cromwell and army policy.

Holly. Tree, 4-187. Chromosomes 2-25; shedding of leaves, 4-172; poisonous berries, 6-236.

Holly Blue. Butterfly, 4-187, 2-141 illus.

Hollyhock. Perennial flowering plant, *Althaea rosea*, 4-187

HONEYCOMB BAG

Holy Roman Empire, 4-187, 3-314; reign of Charlemagne, 2-305; coronations at Aachen, 2-2; Hapsburg rulers, 4-129; struggle with Papacy, 4-308.

Holyrood House, Edinburgh, Scot., royal palace, 3-162.

Holy See. Episcopal see of the R.C. Church in Rome itself.

Holy Thursday. Properly, not Thursday of Holy Week (Maundy Thursday), but the day on which the church commemorates the Ascension of Jesus Christ.

Holy Virgin at the Altar. Painting by Jean Auguste Dominique Ingres, now in the Louvre, 5-47 illus.

Holy War, The (1882). Allegory by John Bunyan, 2-125.

Holywell. Tn. in Flintshire, Wales, pop. 8,196; legend, 3-340.

Holy Year. Festival of R.C. church instituted 1300, to be celebrated every 100 years, but since 1475 it has occurred every 25 years. It lasts from Christmas to Christmas. Marked by pilgrimages to Rome.

Homage, in feudalism, 3-340 illus. to sovereign at coronation, 2-510.

Home Counties. Name given to the counties around London: Middlesex, Essex, Kent, Surrey, Hertfordshire, Buckinghamshire and Berkshire.

Home Guard. Brit. defence force of 2nd World War, 4-188, 7-188.

Home Guard. Variety of early potato 6-273.

Home Office. Brit. govt. dept., 4-188.

Homer. Anc. Gk. poet, 4-188, 4-93; historical origins of epics, 4-72; story of Odysseus, 5-500; the siege of Troy, 7-320; Pope's translation of, 6-250.

Home Rule. Name given to the measures proposed between 1870 and 1914 for the establishment of a separate Irish parliament (Gladstone and, 4-26; O'Connell, 5-499; Parnell, 6-91).

Home Security, Ministry of. Brit. govt. dept. functioning Sept. 1939 to May 23, 1945; the home sec. admin., directed Civil Defence, Defence Regulations, and upheld home morale during 2nd World War.

Homing. Instinct of birds and animals, 4-189; and migration, 5-202.

Hominidae. Zoological family including ape-men and modern Man, 5-105.

Hominy. Coarsely ground maize used in cooking, 5-90.

Homoeopathy. A system of medicine founded by Hahnemann; guiding principle is that a drug causing certain symptoms in normal persons is the proper remedy for a disease showing the same symptoms ("like cures like"); in allergy, 1-113.

Homophones. Words that are sounded alike but spelt differently, 7-125.

Homo sapiens. Scientific name for modern Man, 5-105.

Horns. Spt. in Tripolitania, Libya. Near by are the ruins of Leptis Magna; pop. (with Cusabab) 59,000 4-480.

Horns. Tn. of Syria. Mfrs. gold and silver thread, silk, and cotton textiles; has oil wells and caravans exchange markets; pop. 224,000 7-217.

Hondo (Japan). See Honshu.

Honduras, British. Brit. colony Cent. Amer.; area 8,867 sq. m. pop. 66,892; 4-189.

Honduras, Republic of. Cent. Amer. area 59,161 sq. m.; pop. 1,333,602 4-190, 2-293; map, 2-292; ill. 3-385 illus. f.

Honegger, Arthur (b. 1892). S. composer; symphonies; *Parth* (description in music of a locomotive) for films; 5-306.

Honey. Produced by bees, 1-406; diag., glucose and laevulose 4-36.

Honey Bear, 1-392.

Honey-bee social bees; social organization, 1-405.

Honey Buzzard. Bird, 2-147.

Honeycomb, structure of, 1-405.

Honeycomb Bag. See Reticulum

RULERS OF THE HOLY ROMAN EMPIRE

800-814 Charlemagne
814-840 Louis the Pious
840-911 Later Carolingians
(911-918 Conrad I)

SAXON LINE
919-938 Henry I, the Fowler
938-973 Otto I, the Great
973-983 Otto II
983-1002 Otto III
1002-24 Henry II

FRANCONIAN LINE
1024-39 Conrad II
1039-56 Henry III
1056-1103 Henry IV
1106-25 Henry V
(1123-37 Lothar II of Saxony)

HOHENSTAUFEN LINE
1138-52 Conrad III
1152-90 Frederick I (Barbarossa)
1190-97 Henry VI
1198-1208 Philip of Swabia } rival claimants
1198-1214 Otto IV
1215-50 Frederick II
1250-54 Conrad IV
(1250-73 Great Interregnum)

RULERS FROM VARIOUS HOUSES
1273-81 Rudolph of Hapsburg
1282-98 Adolf of Nassau
1288-1308 Albert of Austria
1308-13 Henry VII of Luxembourg
1314-47 Louis IV of Bavaria
1314-30 Frederick the Fair }

LUXEMBURG LINE
1347-78 Charles IV
1378-1400 Wenceslaus
(1400-10 Rupert of the Palatinate)
1410-37 Sigismund

HAPSBURG LINE
1438-39 Albert II
1440-93 Frederick III
1493-1519 Maximilian I
1519-56 Charles V
1556-64 Ferdinand I
1564-76 Maximilian II
1576-1612 Rudolph II
1612-19 Matthias
1619-37 Ferdinand II
1637-57 Ferdinand III
1653-1705 Leopold I
1705-11 Joseph I
1711-40 Charles VI
(1742-45 Charles VII of Bavaria)
1745-65 Francis I
1765-90 Joseph II
1790-92 Leopold II
1792-1806 Francis II (after 1806 reigned as Francis I of Austria)
(1806 Title of Holy Roman Emperor abolished.)

EMPERORS OF AUSTRIA
1806-35 Francis I
1835-48 Ferdinand II
1848-1916 Francis Joseph
1916-18 Charles

HONEYDEW

Honeydew. Sweet, sticky excreta of plant lice and scale insects deposited on stems and leaves of plants. Popular with ants, 1-182, 1-162.

Honeyuckle. Climbing shrub, 4-190, 2-24 illus. f.; poisonous berries, 6-236.

Hong Kong. Brit. crown colony, (China); 391 sq. m.; pop. 2,060,000; 4-191, 7-491.

Honolulu. Cap. of Hawaiian Is., on Oahu; pop. 499,794; 4-140.

Honorius, Flavius. Rom. emp. of the West (395-423); son of Theodosius.

Honourable Artillery Company (H.A.C.). Brit. regiment, founded 1537 by Henry VIII; 1-258.

Honourable Corps of Gentlemen at Arms. Queen's bodyguard at state ceremonies within doors; part of the Royal Household.

Honshu. One of the islands of Japan, 4-340; map, 4-341.

Honthorst, Gerard van (1590-1656). Dutch painter; Buckingham family, 2-103 illus.

Hooch (hōkh), Pieter de (1629-83). Dutch painter, 5-383 illus.

Hood, Samuel, Viscount (1724-1816). Brit. naval commander-in-chief in America (1767-71); distinguished in various battles 1780-83 with Fr. fleet under De Grasse; commanded in Mediterranean in 1793; great tactician.

Hood, Sir Samuel (1762-1814). Brit. sailor; distinguished himself in several naval engagements, notably against the Fr. in 1802 and 1804; previously served under Nelson at Santa Cruz (1797) and at battle of the Nile (1798).

Hood, Thomas (1799-1845). Brit. poet, 4-191.

Hood. British battle cruiser, largest warship in world for many years; sunk by German battleship *Blücher* using German system of radar at range of 13 m. off coast of Greenland, May 24, 1941, 6-338.

Hood, M.L. in Cascade Range of N. Oregon, U.S.A., 11,225 ft., 45 m. S.E. of Portland.

Hooded Basilisk. Type of lizard, 4-529.

Hooded Crow, 2-536; migration, 6-204 illus. f.

Hooded Merganser. Duck, native of N. Amer., 3-131.

Hoodoo. A person or thing whose presence is supposed to cause bad luck; derived from voodoo.

Hoof. A horny sheath encasing toes of many animals; corresponds to finger-nail or toenail of Man, 5-102.

Hooghli, river. Westernmost arm of the r. Ganges, 3-502.

Hook, Captain. Pirate in Barrie's *Peter Pan*, 1-374.

Hook, Theodore Edward (1788-1841). Brit. humorous author and dramatist; he won popularity with *Gilbert Ourney* and *Jack Brag*, both of which first appeared in the *New Monthly*; he was a great practical joker.

Hookah. Oriental type of tobacco pipe. A bowl holds the lighted tobacco, the smoke from which is drawn through a tube into a bowl of water (often scented) to cool it, thence by a long flexible tube into the mouth of the smoker. Made of glass, porcelain, or metal, and often highly decorated.

Hook, Robert (1835-1703). Eng. scientist; invented the anchor escapement in clocks; improved microscope and thermometer; studied cell structure of animal and vegetable tissues; and Newton, 4-65; signalling device, 7-51; and plant anatomy, 2-24.

Hooker, Sir Joseph (1817-1911). Brit. scientist and botanist. Director of Kew Gardens, Surrey (1845-85). Led botanical expeditions to many parts of world.

Hooker, Richard (c. 1553-1600). Eng. author, wrote *Laws of Ecclesiastical Polity*, a masterly exposition of philosophical and political principles.

Hook of Holland. VII. spt. of Netherlands; point of land at mouth of r.

Maas (Meuse), 18 m. from Rotterdam; terminus of steamer services from Harwich.

Hooper, John (c. 1495-1555). Eng. martyr, bishop, and religious reformer; burned as heretic in reign of Mary.

Hoopes (hōp-pōs). Bird. *Upupa*, common in most of southern and central Europe, about the size of a thrush; has plumage of black, white, and pink mixed, a long-pointed bill, and a large erectile crest of two parallel rows of feathers. Once bred in Britain, now summer visitor; nested in holes in willows.

Hoosac, r., U.S.A.; rises in Mass., and flows S.W. to Hudson r., 90 m. long, 5-145.

Hoover, Herbert Clark (b. 1871). Amer. statesman and mining engineer; food administrator during 1st World War, sec. of commerce in 1921; president of U.S.A. (1929-33).

Hoover Dam, on Colorado r., Arizona, U.S.A., 726 ft. high; formerly called Boulder Dam, 3-29, 32, 33; 1-239, 3-32 illus. f.

Hope, Anthony. Pen-name of Sir Anthony Hope Hawkins (1863-1933). Brit. novelist; *The Prisoner of Zenda* and *Rupert of Hentzau* set fashion for romantic stories involving noblemen of fictitious principalities, e.g. "Ruritania."

Hopei or Hopen. Prov. of N. China, formerly known as Chihli; chief twn., Peking and Tientsin; agric. wealth; area 59,000 sq. m.; pop. 28,614,000, 7-275.

Hopie, Amer. Indian tribe in Arizona, U.S.A.; village, 1-238, 239 illus.

Hopkins, Sir Frederick Gowland (1861-1947). Brit. biochemist; awarded Nobel prize for medicine, 1929, for discovery of vitamin D. Professor of biochemistry, Univ. of Cambridge, from 1911, 5-165, 7-403.

Hopkins, Gerard Manley (1844-89). Brit. poet. His poems were collected and pub. after his death by Robert Bridges, 2-69, 3-291.

Hopkins, Harry L. (1899-1946). Amer. administrator; personal friend and adviser of F. D. Roosevelt, accompanying him to war-time conferences, signing of Atlantic charter, etc.; personal adviser to H. Truman as pres., but resigned; died Jan. 1946; his *White House Papers* pub. 1948.

Hopper. Type of barge, 3-125.

Hoppner, John (1758-1810). Brit. portrait painter, rival of Lawrence, painted portraits of several members of the royal family, 3-260.

Hop-step-and-jump. In athletics; standard performance, 1-292.

Hops, 4-192; drying by charcoal, 2-305.

Hop Trefoil. See under Trefoil.

Horace (Quintus Horatius Flaccus; 65-8 B.C.). Roman poet, 4-193, 4-150, 1-288.

Horas [hor'6] or Hours. In Gk. myth goddesses of the seasons.

Horatius Cocles. Legendary Rom. hero; Rom^o saved by, 6-429; Macaulay's poem, 5-59, 2-62.

Horder, Thomas Jeeves Horder, 1st Baron (1871-1955). Brit. physician; specialist in diagnosis and radiology; Physician in ordinary to George VI.

Horeb, Mt. See Sinai.

Hore-Belisha, Leslie Hore-Belisha, Baron. (b. 1893). Brit. politician. Minister of transport in 1935; introduced special crossings (marked with yellow beacons) for pedestrians (see also *Pedestrian Crossing*); became war minister in 1937, introducing reforms. He resigned Jan. 1940. Made a peer 1954.

Horehound. A genus of plants (*Marrubium*) of the family *Labiatae*, common in hedgerows, has opposite serrated leaves and white flowers. Another plant (*Raietia*), Black Horehound, has purple flowers.

Hormones. Gland secretions, 4-28, 6-189.

Horn, of animals, 4-193.

HORSE-POWER

Horn. Musical instrument, 4-194.

Horn, Cape. Most southerly point of S. Amer., a steep, bare, black rock, 1,390 ft. high, on isl. of the Fuenjian Archipelago.

Hornbeam. A tree (*Carpinus*) of the birch family; long, male catkins conspicuous in spring; leaves serrated, like those of elm, bark grey, corrugated but not furrowed; hardest and heaviest English wood, 4-195.

Hornbill. Bird, 4-195.

Hornblende. A black or greenish-black mineral; magnesium iron calcium silicate; found in crystalline and granular masses; a common constituent of granite and other igneous rocks.

Hornchurch. Urban dist. of Essex, Eng.; pop. 104,128; residential and agricultural.

Horned Toad. Type of lizard, 4-530.

Horned Viper. protective coloration, 6-296 illus. f.

Hornet. Largest of the Brit. wasps, 4-195; protective coloration, 6-296 illus. f.

Hornet-moth. The largest Brit. representative of the clearing moths; bears a striking resemblance to a wasp; larvae burrow in trees; protective coloration, 6-296 illus. f.

Horniman, Annie Elizabeth Fredericks (1860-1937). Brit. theatrical producer; founded Abbey Theatre, Dublin; many notable plays produced at Gaiety Manchester.

Horniman's Museum, Forest Hill, London; anthropology, 5-300.

Horn of Plenty, and Holy Grail legend, 4-51.

Hornsey. Bor. of Middlesex; pop. 98,134, 5-27.

Hornung, Ernest William (1866-1921). Brit. writer of novels with a sensational interest, some of which were dramatised; he created the celebrated character "Raffles", a gentleman thief (*The Amateur Crackman*, *Mr. Justice Raffles*, *The Crime Doctor*).

Horoscope. A chart indication of the position of the heavenly bodies at time of a person's birth. See also *Zodiac*.

Horowitz (hor'ōvits), Vladimir (b. 1904). Russ. pianist; settled in U.S.A.

Horse, 4-196. in Argentina, 1-224, 225; bay as dominant colour, 4-168; evolution of, 1-156, 3-322 illus.; farm horses in U.K., 1-73; anatomy of foot, 3-112 illus.; points of, 4-106 diag.; training police horses, 6-251 with illus.; cold ponies, 6-255; horse-operated rly. lines, 6-356; riding, 6-400; trick riding in circuses, 2-401; sculptures of, 3-197; in sleep 7-67; thoroughbred, 4-196 illus. f.; and zebra, 7-522 with illus. See also table of Breeds in next page.

Horse Brasses, and superstition, 5-78 illus.

Horse Bus, in London, 6-412.

Horse Chestnut. Tree, *Aesculus hippocastanum*, 4-197 with illus. f.; growth, 5-337 illus.; leaves, 4-170, 472 illus.

Horse-fly or Gadfly. A short-bodied fly with horny pointed proboscis adapted for bloodsucking.

Horse Guards, Royal. Regiment of Brit. army, forming, with Life Guards, the Household Cavalry. Regt. now a mechanised reconnaissance unit except for one squadron which remains horsed for ceremonial and guard duties in London and Windsor 5-23, 5-frontis., 1-250.

Horse Latitudes. A zone of light winds between the "trade wind" and "prevailing westerly" zones, 7-458.

Horseman, The. Variety of pigeon, 6-198.

Horsens. Denmark. Spt. on Horsens Fjord; pop. 32,400.; iron products, ships, woodenware; exports butter and bacon.

Horse-power. Engineering unit of force. It is the power or force needed to raise a weight of 33,000

HORSE RACING

pounds to a height of one foot in one minute; equivalent to 746 watts; of electric motors, 5-276.

Horse Racing, 4-198; the Derby, 3-76; Newmarket, 5-399; race-horses, 4-197.

Horseshed. An edible perennial whose white root is served with roast beef and used in sauces, 3-90.

Horse's Head Nebula, in constellation of Orion, 6-360, 361 illus.

Horseshoe or King Crab. A crab-like creature of uncertain zoological relationships, possibly descended from trilobites.

Horseshoe Falls. The Canadian part of Niagara Falls, 5-429, 427 illus.

Horseshell. Primitive plant of genus *Equisetum*, only living member of large prehistoric group. Hollow, jointed stem, whorled simple leaves, spore system of reproduction.

Horse Tramear, 6-412.

Horsesham. Tn. in Sussex, near the head of the Arun; at West Horsesham is Christ's Hospital (boys' public school). Pop. 16,682.

Horsley, Sir Victor (1857-1916). Brit. surgeon who specialised in facial

surgery; was also a pioneer in scientific medicine, 5-165.

Horst Wessel. See *Wessel*, *Horst*.

Horta. A city of the Azores, cap. of Fayal; pop. 8,600, 1-330.

Horthy (hor'té) de Nagybanya, Nikolaus (b. 1868). Regent of Hungary 1920-44; 4-208.

Horticulture, as a career, 2-236.

Horus. In Egyptian myth., son of Osiris and conqueror of Set, 6-6; temple of Edfu, 3-188 illus.

Hoses (8th cent. B.C.). Hebrew prophet, 6-296.

Hoskins, John (d. 1664). Eng. mintaturist, 3-258.

Hosoda Eishi (1746-1829). Jap. artist and print-maker; colour-print, 4-352 illus. f.

Hospital, 4-199; and medieval almshouses, 1-119; operations watched by periscope, 6-126; nursing, 5-485; Florence Nightingale, 5-437; X-ray equipment in, 7-508 illus.

Hospitallers. See *Knights Hospitallers of St. John of Jerusalem*.

Hospital Service, as a career, 2-236.

Hotchkiss, Benjamin (1826-85). Amer. inventor of Hotchkiss machine-gun.

HOWARD

Hotel Management, as a career, 2-236.

"Hot Jazz". Type of music, 4-357.

Hot Springs, Arkansas, U.S.A. Health resort in the Ozark mts.; pop. 29,290, 1-239.

Hotspur, Harry. See *Percy, Sir Henry*.

Hot'tentota. Race of S. Africa now confined to w. Cape of Good Hope and adjoining territory, 1-50.

Houdin (ô'dan'). Robert (1805-71). Fr. conjurer, presided over a Theatre of Magic in Paris, 2-485, 486.

Houdini, Harry (1873-1926). American "escapologist," 2-486.

Houdon, Jean Antoine (1740-1828). Fr. sculptor, 6-524; head of Voltaire, 7-406 illus.

Houghton, (William) Stanley (1881-1913). Brit. dramatist and critic, a leader in realistic Manchester school (*Hindle Wakes*), 3-291.

Hougoumont. A key point of the British front at Waterloo, 7-428; plan, 429.

Hounslow. Dist. of Middx., Eng., within the bor. of Heston and Isleworth. In coaching age the first posting station on Great West Road. In 18th cent. Hounslow Heath was infested with highwaymen.

Hour, in day, 3-55; and time-recording, 7-279.

Houris (hō'riz). In Mahomedan religion, beautiful maidens who minister to the faithful in Paradise.

Hourn, Loch. Sea loch, Inverness-shire, Scot., 4-275.

Housatonic, r. of U.S.A., 150 m. long. Rising in the Hoosac Mts., Mass., it flows N.W., then S. to Long Island Sound, 5-113.

House (Col.) Edward Mandell (1858-1938). Amer. political leader; confidential agent of Pres. Wilson to European govts. during 1st World War; member Amer. Peace Commission in 1919.

House. Architectural development in Eng., 1-211, 217; anc. Egyptian 3-202 illus. See also *Architecture*; *Building Construction*; *Castle*.

House-fly. Two-winged insect of order *Diptera*; flight of, and sense of smell, 4-264.

Household Cavalry, armour, 1-244 colours, 2-466; House Carles, 1-247.

House Martin, bird, 7-198; migration, 5-904 illus. f.

Houses of Parliament. See *Parliament, Houses of*.

House Sparrow, 7-123; egg, 1-452 illus. f.; nest, 1-458 illus.

Housman, Alfred Edward (1859-1936). Brit. poet and scholar; professor of Latin, Cambridge, best-known work *A Shropshire Lad*, —lyric sequence of exquisite sensitiveness to life's beauty and cruelty.

Housman, Laurence (b. 1865). Brit. writer and illustrator, brother of A. E. Housman; distinguished by fantasy and mysticism (*Little Plays of St. Francis, Victoria Regina*).

Houston, Texas, U.S.A., important spl. and rly. centre of S. Tex.; cotton, rice, lumber industries; pop. 596,163; 7-260.

Hout Bay, Cape Peninsula, S. Africa, 7-88 illus. f.

Houten, Conrad van. Dutch cotton manufacturer; first made cotton in 1823, 2-439.

Houyhnhnms (hō'uh'nz). Horse-like creatures ruling over the Yahoos in *Gulliver's Travels*, 7-207.

Hovas. Native tribe in Madagascar, 5-65.

Hove. Tn. and seaside resort of Sussex, immediately w. of Brighton, pop. 69,435.

Hover Fly, stages in the life of, 4-267 illus.

How, William Walsham (1823-97). Brit. divine; bishop of Wakefield, wrote several hymns, 4-226.

Howard. Great Eng. R. Cath. family, head is the Duke of Norfolk, premier duke and hereditary Earl-Marshal of England; family rose to greatness and met misfortune in Tudor reign.

Howard, Bronson (1842-1908). Amer. dramatist, best known for his military melodrama, *Shenandoah*.

PRINCIPAL BREEDS OF HORSES

American Saddle Horse.—Developed in the United States in Kentucky, Tennessee, and Virginia. About 15½ hands (one hand equals 4 ins.) high; weight 1,050 lb. Must have five gaits —flat-footed walk, running walk, trot, canter, and rack.

Arab.—An Arab breed, possibly an offshoot of the Barb of Morocco. Small, 14½ hands high; remarkable endurance and speed; white, grey, bay, or chestnut. English thoroughbreds trace their ancestry from Arab stallions.

Belgian.—Draught horse, descended from Flemish horse used in Middle Ages as a charger. Height 17 hands; weight 2,000 to 2,500 lb.; bay, chestnut, or roan.

Cleveland Bay.—Largest of the carriage horses, a cross between a thoroughbred and a common breed. Graceful appearance with good working qualities. Taller and stronger than a hackney.

Clydesdale.—Draught horse, active, docile, and strong. Similar to a Shire, but smaller, height up to 16½ hands; bay, dark brown, occasionally black, grey, chestnut, or roan. White blaze on face is usual; legs are feathered.

English Thoroughbred.—Breed developed by mating Arab stallions with native mares. Notable sires imported were the Darley Arabian, the Godolphin Barb, and the Byerley Turk. Used principally for racing. Height from 14½ to 17½ hands; weight from 900 to 1,050 lb.

Exmoor and Dartmoor Ponies.—Native to moorlands of south-west England. Hardy and strong; average height about 12½ hands; various colours. Some polo ponies are bred from a cross-strain of Arab and Dartmoor ponies.

Hackney and Hackney Pony (Fr. *haquende*, an ambling horse).

—Old breed, used as saddle and carriage horse. High-stepping walk. Height from 15 to 16 hands. Very strong for its size.

Highland Pony.—Mainly used for riding. Height about 14½ hands; grey is commonest colour.

Hunter.—A type rather than a breed. May be a thoroughbred, or a cross between a thoroughbred and a Cleveland Bay. Usually dark brown, or chestnut.

Percheron.—French breed of heavy draught horse, named from the old province of Perche. Height about 16½ hands; usually grey or black. Similar to Suffolk Punch.

Shetland Pony.—Smallest British breed of horse. Bred principally in the Shetland Islands. Height from 9 to 11 hands; bay, brown, or rusty black. Very hardy. Popular as a children's pony, but capable of carrying heavy loads.

Shire.—Largest British breed of draught horses. Descended from old English war horse. Docile, immensely powerful. Height from 17 to 18 hands; weight about 1 ton. Legs well feathered.

Suffolk Punch.—A powerful breed, bred originally in Suffolk, and used chiefly for agricultural purposes. Hardy, with great pulling power. May weigh as much as a Shire; height about 16½ hands; usually chestnut.

Welsh Cob.—Heavier and stockier than Welsh Pony (*q.v.*). Height from 13 to 14 hands.

Welsh Pony.—Small breed, hardy with great endurance. Height from 12 to 12½ hands.

Yorkshire Coach Horse.—Developed from Cleveland Bay, with considerable thoroughbred strain. About 16 hands high; usually dark bay with darker legs. High-stepping action.

HOWARD

Howard, Catherine (queen of Henry VIII). See **Catherine Howard**.

Howard, Sir Ebenezer (1850-1928). Brit. social reformer; devoted himself to garden city and town-planning development.

Howard, John (1726-90). Brit. philanthropist and prison reformer; work remedied shocking abuses; 6-291.

Howard of Effingham, Charles Howard, 2nd Baron (1536-1624), created Earl of Nottingham 1596, lord high admiral, influential with Queen Elizabeth I, his kin-woman; and Spanish Armada, 1-241.

Howdah. Seat, sometimes covered for riding on elephants, 3-227.

Howe, Elias (1819-67). Amer. inventor of a lock-stitch sewing machine, 7-9.

Howe, Julia Ward (1819-1910). American writer and reformer; pioneer of woman suffrage; wrote "The Battle Hymn of the Republic."

Howe, Richard, Earl (1726-99). Brit. admiral, one of greatest Brit. naval commanders; commanded Brit. sea forces in War of Amer. Independence; relieved Gibraltar (1782); gained victory of "glorious first of June" (1794) over French off Ushant.

Howe, Samuel Gridley (1801-76). Amer. educator and humanitarian reformer; founder of the Perkins Institution for the Blind and of the first school in the U.S.A. for the mentally deficient; 1-485.

Howe, William Howe, 5th Viscount (1729-1814). Brit. soldier; fought in the Seven Years' War and War of American Independence, succeeding Gage in command, 1-138.

Howe, H.M.S. Brit. battleship displacement 35,000 tons; completed 1942; served in Pacific Fleet against Japs. in 1945; since 1946 used as training ship.

Howells, William Dean (1837-1920). Amer. novelist, essayist, and critic; 7-365.

Howe of the Mearns, The. Part of the valley of Strathmore, Kinross-shire, Scot., 4-404.

How Goldenwings Learned to Fly (story of a baby woodpecker), 7-469-72 with illus.

Howitzer. Gun, 1-239.

Howling Monkey, 5-240.

Howrah. Suburb of Calcutta on opposite bank of the Hooghly r.; jute mfrs.; 2-174.

How Screecher Learned to Hunt. The story of a young owl, 6-13.

Howth Head. A peninsula on the E. coast of Irish Rep. forming the N. side of the Bay of Dublin.

Hoxha, Gen. Enver. See **Hodja**.

Hoy (Norse "high island"). 2nd in size (53 sq. m.) of Orkney Isls., 6-4.

Hoy. Single-masted sailing vessel, approx. 20 ft. long and broad in beam, originally used as a ferry between shore and ocean-going ships. Hailed by anyone desiring to hire it, hence its name.

Hoyle, Edmond (1672-1769). Eng. author of works on rules of whist and other games, long regarded as authoritative, so that "according to Hoyle" has become a proverbial phrase.

Hradecany Castle, Prague. Official seat of the Czechoslovakian president and government, 6-280, 279 illus., 7-269.

Hrothgar. King of the Scyldings; in *Beowulf*, 1-431.

Hsuan-Tung. Last emperor of China. See **Pu-Yi, Henry**.

Huallaga, r. in Peru, 6-138.

Huang. For Chinese names beginning thus. See **Hwang**.

Huascarán. Twin-peaked volcano of Peru, height 22,180 ft., loftiest mountain mass in Peruvian Andes.

Huber (Göbner), François (1750-1831). Swiss naturalist, first to gain scientific knowledge of life of bees.

Hubert (hub'ert). Saint (856-727). Apostle of the Ardennes and patron of huntsmen. Festival, Nov. 3.

Hubertusburg, Treaty of. Signed 1763, in castle of Hubertusburg in

Saxony, Ger., ending Seven Years' War, 7-2.

Huckleberry. See **Bilberry**.

Huddersfield. Eng. mfg. tn. in W. Riding of Yorkshire; pop. 129,021; centre of wool and worsted cloth industry, 3-249.

Hudson, Henry (d. 1611). Eng. navigator, 4-129, 6-212; discovers Hudson r., 1-136.

Hudson, Jeffery (1619-82). Eng. dwarf adopted by Queen Henrietta Maria, his amazing adventures, 3-110.

Hudson, William Henry (1841-1922). Anglo-Amer. naturalist and writer. Chief works, *The Purple Land* (1885); *Green Mansions* (1901); *Far Away and Long Ago* (1918). Hudson is commemorated by a bird sanctuary in Hyde Park, London, with sculptural bus-relief by Epstein, 3-294 illus.

Hudson Bay, Canada. The 3rd largest land-locked sea in the world; explored by Henry Hudson in 1610 and named after him; area over 500 sq. m.; 4-200.

Hudson River. U.S.A.; principal r. of New York state, one of the chief highways of commerce; 5-152, 5-421; discovery by Henry Hudson (1609), 1-136.

Hudson's Bay Company. Brit. trading company in Canada, 4-200; and north-west passage, 6-242; trade with Eskimos, 1-221; fur trade, 3-496.

Hudson Strait. Connects Hudson Bay with Atlantic; 500 m. long; extreme breadth, 138 m.

Hue [hooh]. Fortified city, cap. of Annam, Vietnam; pop. 13,000; on Hue r., 10 m. from mouth.

Hue and Cry. Old Eng. common-law practice of pursuing criminal with "horn and voice" ("hue" from old Fr. word for cry or shout).

Huerta [wair'ta], Victoriano (1854-1916). Mex. general, full-blooded Indian; overthrew Madero administration and made himself pres. (1913); resigned (1914); arrested in U.S.A. for fomenting a revolution against Mexico; died before trial.

Hugans, Sir William (1824-1910). Brit. astronomer, pioneer in spectroscopic astronomy; introduced spectroscopic photography into astronomy.

Hugh Capet (c. 930-996). King of France, elected by nobles and prelates to succeed Louis V, last of the Carolingians, 3-449.

Hughes, David Edward (1831-1900). Anglo-Amer. inventor of the printing telegraph which bears his name; 6-311.

Hughes, Hugh Price (1847-1902). Welsh Wesleyan minister and ardent social reformer; he founded the *Methodist Times*.

Hughes, Richard (b. 1900). Brit. (Welsh) writer. (*High Wind in Jamaica*), 7-415.

Hughes, Sir Sam (1853-1921). Canadian soldier and political leader; a minister of militia and defence was responsible for raising and equipping a large part of the 60,000 men that Canada contributed in the 1st World War.

Hughes, Thomas (1822-96). Brit. author and social reformer; entered parl. 1865; he was a co. court judge, but is best known for his books *Tom Brown's School Days* and *Tom Brown at Oxford*, 2-35.

Hughes, William Morris (1864-1952). Australian statesman and prominent labour leader; prime min. of the Australian Commonwealth, 1915-23.

Hugh of Lincoln. Eng. boy said to have been put to death by Jews at Lincoln in 13th cent. in mockery of the death of Christ.

Hugh Town. Largest tn. and cap. of Selly Isles, on St. Mary's; air and steamer services, 6-509.

Hugin. In Norse myth., one of the two ravens of Odin, 5-500.

Hughli. See **Hooghli**.

Hugo, Victor Marie (1802-85). Fr. poet and novelist, 4-200, 3-456, 5-472.

'HUNDRED DAYS'

Huguenots. Fr. protestants of 16th and 17th cents., 4-201, 3-450, 451; Coligny and, 2-453; colonies in Brazil and Florida, 1-136; persecuted by Richelieu, 6-100; silk weaving, 7-53.

Hula. Rare bird of the crow family, native to forests of North Island, New Zealand. Approx. 18 in. long. Black, with greenish gloss, orange wattles below cheeks, tail tipped white. Protected by N.Z. govt.

Huitzilopochtli. Aztec war-god; human sacrifice, 1-333.

Hulaku Khan (d. 1265). Mongolian leader, first independent ruler of Persia.

Hull, Cordell (1871-1955). Amer. politician; secretary of state under Franklin Roosevelt, 1933-44.

Hull. City and spt. in Yorks, East R., on r. Humber; pop. 299,068. Full name is Kingston-upon-Hull, 4-202; fisheries, 3-252. University Coll. received full univ. status, 1951.

Humanists, scholars of the Renaissance, 6-381.

Human Rights, Declaration of. International bill drawn up by a U.N. commission (chairman Mrs. E. Roosevelt) and adopted by the U.N. Dec. 10, 1948, stating in 31 articles the fundamental minimum rights of every human being.

Human Temperature, 7-268.

"Human" Torpedo, 7-294, 293 illus.

Humber. Estuary formed by the Trent and Ouse in N.E. Eng., 3-247; Hull docks, 4-202.

Humber, r. of Newfoundland, 5-391.

Humbert I (1141-1200). King of Italy; succeeded 1178; popularly called "Humbert the Good" because of courage and generosity in plague and earthquake; fostered policy of colonial expansion; assassinated.

Humble-bee, life of, 1-407 with illus.

Humboldt, Alexander, Baron von (1769-1859). Ger. naturalist, explorer, founder of modern science of physical geography, and contributor to nearly every branch of science.

Humboldt, Karl Wilhelm, Baron von (1767-1835). Ger. philologist, statesman, and writer, first to define philosophy of speech; brother of Alexander von Humboldt.

Humboldt's Woolly Monkey. S. Amer. monkey, 5-241 illus.

Hume, Allan Octavian (1829-1912). Indian civil servant in Bengal civil service; worked for Indian parliamentary system through Indian National Congress, 4-253.

Hume, David (1711-76). Scottish philosopher, historian, and political economist. (*A Treatise of Human Nature*, 1737; *Essays - Moral, Social, and Political*; first part of *A History of England*, 1751, other parts in 1756, 1759 and 1762; 3-288, 6-160, 6-514).

Humerus. In anatomy, the upper arm bone, 1-144 diag.

Humidity. Of the atmosphere, 3-319; nature of, and measurement, 1-80, 4-225.

Humming-bird, 4-203; incubation of eggs, 1-460; tongue of, 7-291; caught by giant spider, 7-132 illus. f.

Humming Bird Hawk moth, 2-144 illus.

Humours, The. In medieval medicine, 4-179.

Humpback Whale, 7-446 illus.

Humperdink (hoom'perdink). Engelbert (1854-1921). Ger. composer, chiefly known for his opera *Hänsel und Gretel*; 5-517.

Humus. Decayed organic matter, important in relation to fertility of soil; bacteria and, 5-144.

Hunan. An inland prov. of China; 105,000 sq. m.; pop. 28,092,000; cap. Changsha; immense coal and iron deposits, also yields wolfram and antimony; one of the chief tea-producing regions of the world.

Hundred. A division of Eng. and Welsh counties, so called because it supplied 100 soldiers.

"Hundred Days". Period between date of Napoleon's return to Paris from Elba, March 20, 1815, and the restoration of Louis XVIII, June 28,

HUNDREDWEIGHT

Hundredweight (cwt.). A unit of weight. See *Weights and Measures* (illus.).

Hundred Years' War (1338-1453), 4-203, 2-308; battle of Crécy, 2-327; Agincourt, 1-68; Joan of Arc, 4-376; Orléans, 6-5; Henry V's victories, 4-163; effects in France, 8-450.

Hungarian Pigeon, 6-199 illus.

Hungary. A communist republic in cent. Europe; area 35,902 sq. m.; pop. 9,205,000; 4-206; map, 4-205; flag, 2-384 illus. f.; agriculture and industry, 4-205, 3-393; Hungarian plain, 3-309, 4-205; *Magyars*, 5-88; New Year customs, 5-410; costume, 2-350 illus.; stamp, 7-143 illus.; history, 4-206; 2-314, 316, 7-480; battle of Mohács, 7-334; capture of Szeged, 7-333 illus.

Hungerford Bridge, London, Brunel and 2-99.

Huns. Nomadic people of Asiatic origin, 4-208; Attila as king, 1-306; and Goths, 4-49, 6-198.

Hunstanton (hun'stan). Tn. in Norfolk, Eng., pop. 3,414; 5-448.

Hunt, Sir John (b. 1910). Brit. mountaineer and soldier; leader of successful Everest expedition in May 1953, 3-321.

Hunt, Leigh (1784-1850). Brit. poet and essayist, friend of Byron, Keats, and Shelley; sentenced to two years' imprisonment in 1813 for a libel on Prince Regent during which he wrote *The Story of Rimini*; 4-394.

Hunt, Walter (19th cent.). Amer. Quaker who invented a type of sewing machine, 7-9.

Hunt, William Holman (1827-1910). Brit. painter, who, with Rossetti and Millais, founded the Pre-Raphaelite Brotherhood as an active protest against the Eng. art of his period; 6-285, 3-284; *The Light of the World*, 4-367 illus.; *Two Gentlemen of Verona*, 6-284 illus.

Hunter, John (1728-83). Brit. physiologist and surgeon, 4-208; work on anatomy 1-143, 5-192, 7-194; and Charles Byrne, 4-17; portrait, 5-164.

Hunter, William (1718-83). Brit. anatomist and obstetrical surgeon, brother of John Hunter; physician-extraordinary to Queen Charlotte.

Hunter, Sir William Wilson (1840-1900). Brit. historian, geographer and statistician; organized the first Indian census in 1872 and produced the *Statistical Survey of India* (128 volumes), which formed the basis of the *Imperial Gazetteer of India*.

Hunter's Moon. Full moon following the harvest moon. Generally in Oct.

Hunting. Sport, 4-209; primitive hunting and development of agriculture, 1-71, 3-102; hunting dogs, 3-100, 102; elephant-hunts, 3-227; fox-hunting, 3-426; cowning hares, 4-132; opossum, 5-521.

Huntingdon. Co. tn of Hunts, Eng., pop. 5,282; 4-210 with illus.

Huntingdonshire. County of England; area 386 sq. m.; pop. 69,273; co. tn. Huntingdon; 4-210.

Hunting Leopard. See *Cheetah*.

Huntington, Henry Edwards (1850-1927). Amer. railway magnate; art and book collection, 2-451; museum, 5-301.

Huntington, West Virginia, U.S.A. Commercial and industrial city on Ohio r., pop. 86,353; Marshall College; rly. workshops, foundries, lumber mills; 7-403.

Huntly. Tn. in Aberdeenshire, Scot.; pop. 4,789; 1-5.

Huntsman, Benjamin (1704-76). Eng. clockmaker and inventor of cast steel 4-260 7-23.

Hunyadi (hoon'yah'dé). Janos or John (c. 1387-1456). National hero of Hungary, warrior and statesman; his defence of Belgrade against Turks in 1456 made Hungary independent for 70 years; 4-208, 7-334.

Hupoh (hoo'pá). A cent. prov. of China; 80,000 sq. m.; pop. 24,659,000; cap. Wuchang; chief city Hankow; coal, iron.

Hurdling. Running and jumping races over short distances, in which a series of ten flights of hurdles is set, 1-290, 292, 291 illus.

Hurling. Game resembling hockey, 4-210, 4-184.

Hurling. Type of football played at St. Columb Major, Cornwall, 8-414.

Hurlingham. Dist. and sports club of s.w. London; club h.q. of Brit. polo; N. part taken over by L.C.C. as open space in 1948.

Huron, Lake. Second in size of the Great Lakes of N. Amer., forming part of the boundary between U.S.A. and Canada, 2-196; discovered by Champlain, 4-68, 2-199; map, 4-69.

Hurricane. High wind with velocity of 64-71 m.p.h., 7-169, 3-16; at Jamaica, 4-338; in Caribbean, 2-212.

Hurricane. Type of Brit. fighter plane used in 2nd World War, 2-76, 78.

Hurricane Bird. See *Frigate Bird*.

Hurtleberry. See *Bilberry*.

Hurstmonceux. Village in Sussex, Eng.; castle acquired in 1946 as h.q. of Royal Greenwich Observatory.

Huskies. Dogs, 3-101, 102 illus.; in Labrador, 4-428, illus.

Huskisson, William (1770-1830). Brit. politician, killed at opening of Liverpool and Manchester railway, 6-354.

Huss, John (c. 1369-1415). Bohemian religious reformer, 4-211, 1-504.

Hussar. Originally, Hungarian light cavalry of 15th cent. Later introduced into all European armies; Brit. uniform (1832), 1-249 illus.

Hussain (h. 1936). King of Jordan, 4-382.

Hussain Ibn Ali (hoossein'ib'nah'li). (1856-1931). King of the Hejaz.

Hussain, Hajj Mohammed Emir al (b. 1895). Self-styled "Grand Mufti" of Jerusalem, spiritual leader of Arabs in Palestine, inspired anti-Zionist disturbances during 1935-36; fleeing to Lebanon and Baghdad, and finally to Berlin (1941), he conspired with Hitler against U.K.; in 1946 he got to Egypt in spite of Brit. precautions, and played important part in activities of the Arab League.

Hutchinson, Arthur Stuart Menteth (b. 1879). Brit. novelist. (*If Winter Comes; This Freedom; One Increasing Purpose*).

Huth, Henry (1815-78). Brit. banker and book collector; bequeathed part of his library to the British Museum.

Hutton, Ulrich von (1184-1233). Ger. humanist, reformer and satirical writer, friend of Luther, 3-376.

Hutton, Sir Leonard (b. 1916). Eng. cricketer; opening batsman for Yorkshire and England; in 1938 against Australia at the Oval broke world Test match record by scoring 364 in 13 hrs. 20 mins.; in 1949 made 3,429 runs, inc. 1,294 in June (record for one month). First professional to captain England, 1953. Retired from cricket and knighted, 1956.

Huxley. Famous Brit. family, 4-211.

Huxley, Aldous Leonard (b. 1894). Brit. novelist and essayist; 4-212.

Huxley, Julian Sorell (b. 1887). Brit. biologist; first director-general U.N.E.S.C.O., 1946-49; 4-212.

Huxley, Leonard (1860-1933). Son of T. H. Huxley; editor of the *Cornhill Magazine*, 4-212.

Huxley, Thomas Henry (1825-95). Brit. biologist and zoologist; exponent of the theory of evolution formulated by Darwin, 4-211, 3-291; and Wilberforce, 3-51.

Huxley-Jones, Thomas Baylis (b. 1908). Brit. sculptor; statue of Livingstone, 6-323 illus.

Huygens (hi'genz), Christiaan (1629-95). Dutch mathematician, astronomer, and physicist; applied pendulum to the clock, 6-115; improved the telescope; theory that light consisted of ether vibrations, 4-500; microscope, 1-143.

Huyssmans (hsmah'n'), Joris Karl (1848, 1907). Fr. realistic novelist (*Le Rebours; En Route; La Cathédrale*).

Huysum, Jan van (1662-1749). Dutch

HYDROFLUORIC ACID

painter, 5-384; Vase with Flowers, 5-392 illus.

Hwan. See *Money* (table).

Hwang-hai. See *Yellow Sea*.

Hwang-ho (hwong'law). Riv. of China also known as Yellow River, 4-212; flood damage, 2-364; pop. in valley, 1-268.

Hyacinth. Flower, 4-213; bulb, 2-119; bulb fields in Netherlands, 5-375 illus.

Hyacinth. In Gk. myth., a beautiful youth beloved by Apollo, 4-213.

Hyacinth, Wild. See *Bluebell*.

Hyades. Constellation, 2-490 diag.

Hyasna. See *Hyena*.

Hyatt, John Wesley (1837-1920). Amer. chemist; devised a method of purifying large bodies of water; invention of celluloid, 2-287.

Hybrids, and Mendel's theory of heredity, 5-169, 168 illus.

Hyde, Douglas (1860-1949). Irish historian and poet. Elected 1938 first pres. of Eire. Prof. of Modern Irish, National Univ. of Ireland (1909-32), pres. of Gaelic League (1893-1915). Encouraged revival of Gaelic.

Hyde, Edward. See *Clarendon*.

Hyde Park. Open space in w. London covering 361 acres, the chief entrances are from Hyde Park Corner at the s.e. corner, and the Marble Arch at the n.e. corner, site of 1851 Great Exhibition when Crystal Palace was here; Rotten Row is used by riders, and "Speakers' Corner" in N.W. by impromptu orators, 5-26.

Hyderabad. State of Rep. of India, area 82,313 sq. m. pop. 18,652,964. cap. Hyderabad city pop. 739,160 4-241; accession to India, 4-253; former princely state, 4-239.

Hyderabad. City and dist. of Sind, Pakistan. City is in junction, in industries, metal and lacquer work pop. 130,000. Area of dist. 1,176 sq. m.; pop. 760,000.

Hyder Ali (c. 1722-82). Indian ruler of Mysore, formidable rival of Brit., defeat, 4-136.

Hydra. In Gk. myth., a nine-headed monster, 4-213; killed by Heracles, 4-166, 167 illus.

Hydra (Zool.). Small fresh-water creature, 4-213.

Hydrangea. Flowering shrub, 4-214.

Hydrargyrum. Gk. name for element Mercury, from which is derived its symbol Hg., 5-171.

Hydraulic Brakes, used on motor vehicles, 2-44, 4-215.

Hydraulic Cement. Any cementing substance which sets under water.

Hydraulic Jack, 4-215 with illus.

Hydraulic Jet Propulsion, in ships, 4-371.

Hydraulic Lift, how it works, 4-215.

Hydraulic Mining. Excavation of surface ore by washing down with powerful streams of water, practised in gold mining.

Hydraulic Press, 4-215, 214 illus.

Hydraulic Ram, type of pump, 6-306 307 diag.

Hydraulics. Branch of engineering concerned with use and control of liquids in pipes and channels, 4-214.

Hydraulics. Type of organ, 6-3, 5-202.

Hydro. Ferry-steamer sunk by Norwegian saboteurs in 2nd World War when used as carrier of heavy water stocks by Germans, 1-333.

Hydrocarbons. Chemical compounds of hydrogen and carbon, 2-319.

Hydrochloric acid (HCl). Colourless compound of hydrogen and chlorine, 4-215, 1-12; manufacture and uses, 2-378.

Hydrocyanic or Prussic Acid. A poisonous compound of hydrogen, carbon and nitrogen in equal parts, 6-236.

Hydro-electric Installations, 4-217.

Hydro-electric Power. Electric current obtained by the conversion of hydraulic energy into electrical energy as by water flowing through turbine driving generators; Alpine-Apenine interchange, 1-182; turbines, 7-330 diag.; in Scotland, 3-217.

Hydrofluoric Acid. A compound of hydrogen and fluorine in equal parts; used in etching on glass, 4-120 and tantalum, 1-12.

HYDROGEN

Hydrogen (H). Chem. element; atomic no. 1; atomic weight 1.0080; the lightest known chemical element, 4-221, 3-234; in acetylene gas, 1-9; in air, 1-80, 81; in ammonia, 1-140; atomic bomb, 1-305; in balloons, 1-353; theory of hydrogen bomb, 1-301; molecules, 3-508.

Hydrogenation. Chemical reaction involving addition of hydrogen to a substance. Hydrogenation of coal to yield oil products, 4-222; of oils and fats, 5-124, 5-506.

Hydrogen in concentration, 1-12.

Hydrogen Peroxide. A compound of hydrogen and oxygen in equal parts; as disinfectant, 3-92.

Hydrogen Sulphide (sulphuretted hydrogen), 7-186.

Hydrogen thermometer, 7-268.

Hydrological cycle, floods and, 3-390.

Hydrolysis. Chemical decomposition of an organic compound by the interaction of water, the water itself being also decomposed. Also, the formation of an acid and a base from a salt by interaction of the ionic dissociation of water. Esters (q.v.) can be hydrolysed to form an alcohol and acid. *See also* Saponification.

Hydrometer. Instrument for measuring the specific gravity of liquids, 4-222.

Hydrophobia (hidrófób'ia), or **Rabies.** Disease caused by a virus in saliva of infected animals, and injected by their bites; vaccine discovered by Pasteur, 6-85.

Hydrophone. Device for listening under water; used to detect submarines.

Hydrophytes. Plants which live in watery situations.

Hydroplane. A type of motor-boat which skims lightly over the water; the word is also sometimes wrongly used to signify "seaplane."

Hydroplane. Horizontal fin rudder of submarine, 7-175, 176 illus.

Hydroponics. The growing of crops in balanced chemical solutions, without soil; suitable for cattle fodder, also fruit and vegetables; used for Allied

occupation troops in Japan after Second World War.

Hydrosphere, oceans and seas on earth's surface, 3-180.

Hydrostatics. Science of pressure and other phenomena in liquids at rest; Archimedeon principle, 1-208.

Hydrotherapy, a branch of physiotherapy, 6-193.

Hydrotropism. The tendency of plant structures to grow towards water.

Hydroxide. A compound containing one or more elements in combination with a hydroxyl group.

Hydroxyl Group, in acid-base reaction, 1-12; behaviour in bases, 1-111.

Hydroxylon, behaviour in acid-base reaction, 1-12.

Hydrozoa (Zool.). Class of *Cœlenterata*, primitive animals; jelly-fish, 4-360.

Hyena. Carnivorous animal, 4-222.

Hygieia. (Gk. goddess of health; science of hygiene named after, 4-223.

Hygiene, 4-223.

Hygrometer. Instrument for measuring humidity, 4-225.

Hyksos, or Shepherd Kings, of anc. Egypt (c. 1680 B.C.-1570 B.C.), 3-196.

Hymen. In Greek mythology, the god of marriage, from whose name the word "hymeneal" (meaning pertaining to marriage) derives.

Hymenoptera. Order of insects, including ants, bees, and wasps; in classification of insects, 4-270; gall wasps, 4-268 illus.; ichneumon fly, 4-234; reproduction, 4-265.

Hymettus, Mt. Greece; famous for honey in anc. times; 1-287.

Hymns, 4-226.

Hyndman, Henry Mayers (1812-1921). Brit. Social Democrat (*Evolution of Revolution*).

Hyne, C. J. Cutcliffe (1866-1944). Brit. novelist, chiefly remembered for his *Adventures of Captain Kettle*, and other books in same series.

Hyoscin. *See* Scopolamine.

Hypatia (hipát'shia) (c. A.D. 370-415). A Gk. woman mathematician and philosopher of Alexandria, murdered by Christian mob; the heroine of Kingsley's novel of that name

ICHTHYOSAURUS

Hyperbola (hipér'bola). The name given in geometry to a curve so drawn that any point on it is distant from two fixed points called foci by a difference which is constant for all points.

Hyperbole (hipér'bolé). Figure of speech, 3-351.

Hyperboreans. In Gk. myth., people dwelling in land beyond north wind; connected with worship of Apollo.

Hyperion (hipér'ion). In Gk. myth., a Titan, father of Helios the sun god; later, sometimes the sun god himself; subject of poem by Keats.

Hypermetamorphosis. The type of insect growth in which the larva undergoes more than one transformation before becoming a pupa.

Hypen, in punctuation, 6-309.

Hypnotism. A condition resembling normal sleep, except that the hypnotised subject may retain some of his waking faculties.

Hypo. Name commonly given to hyposulphite of sodium; used in photography, 6-182.

Hypocaust. System of central heating used by Romans. Invented by Sergius Orata (c. 100 B.C.) for public baths, later adapted for dwelling houses. Hot gases from an external furnace passed through conduits under the floor.

Hyposulphite of Sodium ("hypo"). A salt of sodium and hyposulphurous acid used in photography; 7-187.

Hypsometer. Instrument for measuring temperature of boiling water, used by 19th cent. explorers, for estimating height above sea level, 7-152.

Hyrax. Small mammal, relative of the elephant, 5-100 illus.

Hyssop. A garden herb with leaves from which a tea is made for use in the treatment of lung diseases. The hyssop mentioned in the Bible as a plant, used for sprinkling purposes, is a different plant.

Hysteria. 6-300; first used for, 3-368.

Hythe. Tn. and seaside resort of Kent, Eng.; one of the Cinque Ports; pop. 9,218; 2-402.

I

THE letter I is one of the simplest in form, but was not always so. The Egyptians represented it by two parallel lines and the scribes wrote it like this *y*. The Phœnicians gave it the form *z*, and called it *yod*. As written by the Hebrews (*yod*) was such a little insignificant letter that its name came to be used for the smallest part, the least bit of anything. The Greek I (*iota*)

is used similarly and was first written as a zigzag like a thunderbolt, but was finally straightened to upright I, which the Romans adopted. *Yod* was first a consonant with a sound like our *y*; in Latin it was a vowel and a consonant. As a vowel, its name and its long sound rhymed with "bee," and it was not until the late 16th cent. that its name and its long sound in English became i.

Iago. Villainous character in Shakespeare's *Othello*, 6-9.

Iambic Pentameter, metre of Eng. blank verse, 6-234; 3-285.

Iambus, in poetry, 6-233.

Ibadan. Tn. and dist. of the w. prov. of Nigeria, Africa; fair pastoral and agricultural land; Ibadan is largest native tn. in W. Africa (pop. 450,000); 119 m. by rly. N.E. of Lagos; trade in groundnuts, palm oil and kernels, cotton products, hides; 5-435, 436, 7-440.

Ibáez (ibahn'yeth), Vicente Blasco (1867-1928). Span. novelist, 7-122.

Iberia (ibér'ia). Anc. dist. between Caucasus Mts. and Armenia, now part of Georgia; also anc. name of Spain.

Iberian Peninsula. In s.w. Europe, 3-308.

Ibex. Wild mountain goat, 4-227, 4-37.

Ibis. Wading bird related to storks, 7-168 with illus.

Ibn Sa'ud (1880-1953). Arab. ruler; enlightened dictator of Nejd and Hejaz from 1926, he aimed at union of

Arabia under one king and one faith; in 1932 became King of Saudi Arabia; conquests, 1-190.

Ibrahim Pasha (ibrah'hém' pashah') (1789-1848). Eg. general, adopted son of Mehemet Ali, viceroy of Eg.; Turkish commander (1826-28) in Gk. war for independence.

Ibsen, Henrik (1828-1906). Norwegian playwright, 4-227, 3-122, 5-467.

Icarus. In Gk. myth., son of Daedalus; story of, 1-27, 28 illus., 3-25.

Ice, 4-228; freezing, 3-465; compression and melting, 3-466; "dry ice," 3-465; glaciers, 4-25; why it floats in water, 7-424; ice-breaker in Baltic, 1-357 illus.

Ice Age, 4-228, 7-162; Agassiz's theory, 1-87; and geological periods, 3-516; in N. Amer., 5-454.

Ice-axe, used in mountaineering, 5-285, 287 illus.

Iceberg, 4-229, 1-166 illus.; in Antarctica, 1-164.

Ice-cap in Antarctica, effect on world geography, 1-163, 169; in Greenland, 4-95 illus.

Ice-Cream, 4-230; seaweeds in manufacture, 1-103.

Ice-Hockey, 4-232.

Iceland. Isop. in N. Atlantic; area 39,700 sq. m.; pop. 144,293; cap. Reykjavik, 4-233; map, 4-234; flag, 3-384 illus. f.; fisheries, 3-380; Great Geyser, 4-16.

Icelandic Sagas, 4-233, 231.

Iceland Moss. Type of lichen, 4-491, 5-273.

Iceli. Tribe inhabiting E. Anglia when Romans invaded Britain. Revolted in A.D. 61 under their queen Hloddeca, but the rising was quelled, 1-166.

Ice Rink, advantage over natural ice, 7-59.

Ichneumon (iknám'on). Another name for the monogose (q.v.).

Ichneumon Fly. Four-winged insect of the order *Hymenoptera*, 4-234, 3-172.

Ichthyology (ikthiol'ol'i). The science of fishes. *See* Fish.

Ichthyosaurus, big prehistoric reptile, 6-282, 283 illus.; discovery in Eng., 1-159.

ICKNIELD WAY

Icknield Way. Early Eng. name for a prehistoric track running from nr. Wantage, Berks, to Dunstable, Beds. Much of the track is incorporated in modern roads.

Iconoclasm. In Byzantine history, movement for the destruction of sacred images, led by Leo III (from Gk. *ikon*, image; *klasma*, breaking), 2-150.

Ictinus [iktinus] (5th cent. B.C.). Gk. architect, designer of the Parthenon.

Ida. Mt. range of Asia Minor, 30 m. S.W. of plain of Troy.

Ida, Mt. Crete, now called Psiloritti. Fabled birthplace of Zeus, 7-319.

Idaho. North-western state of U.S.A.; area 83,557 sq. m.; pop. 588,637. Cap. is Boise; 4-234.

Idealism. School of philosophy, founded by Bishop Berkeley, 6-160, 3-288.

Idographic Writing. Writing which represents not sounds but pictures or ideas, 1-119; in Chinese script, 2-365.

Ides. In Rom. calendar, 3rd "land-mark day" in the month; Ides were 15th of March, May, July, and Oct., other months 13th, 2-174; Caesar and Ides of March, 2-163.

Ido. Artificial international language, 4-445. See also *Esperanto*.

Idris I (Mohammed Idris el Mahdi es Sennusi; b. 1890). 1st King of United Kingdom of Libya.

Ife. Tn. in Nigeria, 5-435.

Ifing. Village of Oxfordshire, Eng.; church doorway, 1-202 illus.

Ifugaos. Primitive native people of Philippine Isls., 6-156, 157 illus.

I.G. Farbenindustrie. Ger. chemical combine at Frankfurt, 3-460.

Igloo. House of ice and snow built by Eskimos, 3-297 illus.

Ignatius, St. (d. c. A.D. 116). Bishop of Antioch, Apostolic Father, and eager martyr; legend says he was disciple of the Apostle John.

Ignatius Loyola, St. See *Loyola*.

Igneous Rocks. 6-424, 6-320, 3-515.

Ignis Fatuus [ignis fatuus] (Latin "foolish fire"), or "will-o'-the-wisp," flickering pale-bluish light caused by marsh gas, 5-331.

Ignition. Induction coils used for, 4-269; in motor vehicle, 5-279.

Ignition Point. The temperature to which a substance must be heated before combustion can take place.

Igorots. Primitive native people of Philippine Isls.; house, 6-156 illus.

Iguana. A lizard, 4-235; eaten by Man, 4-529; foot, 3-413 illus.

Iguanodon. Prehistoric animal, 6-281.

Iguassu or Guazú [igwahsoo]. River in S. Brazil; rises near Atlantic, flows W. 800 m. to Paraná r.; falls 20 m. above mouth 215 ft. high, broken into 20 or more falls separated by rocky isls., among finest in world

Ilminium (element). See *Promethium*.

Illinois. State of U.S.A.; area 56,400 sq. m.; pop. 8,712,170; cap. Springfield, 4-235.

Illinois River. N. Amer., flows 500 m. S.W. to Mississippi r., 5-452.

Illumination. of manuscripts, 5-116.

Ilustrious, H.M.S. Aircraft carrier, 5-346 illus.

Illyria [il'ria]. Indefinite region on eastern coast of Adriatic Sea.

Illyrian Peninsula. See *Balkan Peninsula*.

Ilmen, Lake. N.W. Russia. Area 350 sq. m.; 6-172.

Ilmenite. The principal ore of titanium, 7-282.

Iloilo. Tn. in Philippine Isls.; pop. 110,123; 6-156.

Ilorin. Tn. in Nigeria, W. Africa; pop. 53,000; leather, pottery, and cotton mfrs.

Ilius. In Gk. myth., founder of Troy or Ilion; grandfather of Priam.

Image. in optics, 4-480, 181 with diag., 5-522.

Imago [imägo]. Term denoting the final form of insect development.

Imari Ware (Jap. pottery). See *Hizen Ware*.

Imbros. Greek isl. in Aegean Sea, near Dardanelles; 87 sq. m.; anc. Gk. colony, later Turkish possession until 1920; returned to Turkey in 1923.

Imitation of Christ. The. Famous work of piety (c. 1118) by Thomas à Kempis, 1-87.

Immanuel or Emmanuel (Heb. "God is with us"). The divinely appointed deliverer foretold by Isaiah (vii. 14) and recognized by the Evangelist in Jesus (Matt. i. 23).

Immigration. Entrance into a country for permanent residence; the opposite of emigration.

Immunity. natural immunity from infection, 4-15.

Impeachment. The prosecution by a government of one of its civil officers; in England the House of Commons prosecutes before the House of Lords; an historic instance was the impeachment of Warren Hastings (q.v.).

Impedance. In electricity, 3-216.

Imperial Airways. British air transport company formed in 1924, absorbed in B.O.A.C. in 1910; history, 1-85.

Imperial Bushel. dry measure (2,218 192 cubic inches).

Imperial Chemical Industries (I.C.I.). Industrial combine formed in 1926.

Imperial College of Science and Technology. London. A school of London Univ., estab. 1907; includes the Royal College of Science, Royal School of Mines, and City and Guilds College; 5-28.

Imperial College of Tropical Agriculture. Trinidad. Founded 1921 as W. Indian Agric. Coll., at St. Augustine, nr. Port of Spain, Trinidad; centre from 1929 for post-graduate training in tropical agriculture and research.

Imperial Crown of State (British), 2-536

Imperial Gallon. A measure of capacity (4,546 litres); 7-124.

Imperial Institute. London, S.W. erected as the national memorial of the jubilee of Queen Victoria; the work of the Institute is to display and illustrate the natural resources and industries of the Commonwealth and to supply information about it.

Imperial Palace. in centre of Tokyo, Japan, built in 1888, 7-289.

Imperial Standard Wire Gauge. 7-464.

Imperial War Graves Commission. Instituted in 1918 to maintain permanently the graves of British soldiers killed during the 1st World War. Continued for 2nd World War.

Imperial War Museum. Lambeth, 5-28, 5-300.

Im'phal. Cap. of Manipur state, Rep. of India; pop. 80,000; isolated by Jap. advance, but held as key point March to June 22, 1914, by Allied 4th Corps, provisioned by airlift; relieved by 33rd corps and became Allied milit., air, and supply base; 4-241; 1-276, 7-496.

INDIA

Imports and Exports. and exchange control, 3-419.

Imposition. in printing books, 2-6 with diag.

Impressionism. Movement in painting, 4-236, 3-140, 6-31.

Incandescence. Emission of light by a substance because of the latter's high temperature, as in a glowing electric lamp filament. Also the emission of light through ionisation of a substance, as from the glowing gas in a vacuum discharge tube. Of iron, 1-298 with illus., of lamps, 3-220.

Incantations and Spells. and magic, 5-78.

Incas. People of S. America, 4-237; civilization and history, 6-142; descendants of, 7-98; ruled towns, 6-140 illus.

Incendiary Bomb. types of, 1-511.

Incense. Aromatic mixtures which yield a pleasing perfume when burning; made of spices and resins.

Inchoape Rock. Dangerous reef off Fifth of Tay, Scot.; also known as Bell Rock; submerged at spring tides; lighthouse built here in 1807; formerly bell tolled to warn mariners; subject of poem by Southey.

Inchmarnock. One of the seven islands of Buteshire, Scot., 2-134.

Inchon. Port of S. Korea on W. coast; pop. 216,000, 4-426.

Inchisari, Cape. Promontory forming S. entrance of Dardanelles; early lighthouse at, 4-502.

Incisors. Chisel-like front teeth in mammals, 5-102, 7-236 illus.

Inclined Plane. in mechanics, 5-157.

Income Tax. A direct tax much used in modern countries, including Britain, as a means for defraying the increasing expenses of government, P.A.Y.E. ("Pay As You Earn") introduced April 1944; 7-231.

Incubation. of birds' eggs, 1-451, 460

Incanabula [inknab'ula]. Term applied to very early printed books.

Independent Labour Party (I.L.P.). Branch of British socialist movement, founded in 1893 by J. Keir Hardie and others, 7-81.

Independence Day (U.S.A.). See *Fourth of July*.

Independence Hall. Historic building in Philadelphia, U.S.A., 6-153.

Independents. Older name of Congregational sts., Free Church denomination in which each local body is virtually independent.

Independent Schools. Public or private schools charging fees, and unsupported by public funds, 6-506.

Independent Television Authority. 7-254, 255.

Index Librorum Prohibitorum. List of books prohibited by R.C. Church.

India. Union of a Republic within the Commonwealth; area 1,056,600 sq. m.; pop. 356,829,815; cap. Delhi; 4-239; map, 4-238; flag, 3-384 illus. f.; physical features, 4-240; monsoon, 5-248; and civilization, 1-269; Aryan-speaking peoples, 1-262; deficient diet of southern peoples, 3-409; malaria 5-91.

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Religion, Caste and Customs: 4-242, 4-178, 4-254; marriage 5-134; meals, 5-151; Itam Lilla, 4-231 illus. f.; suttee, 5-135

Parsees, 6-93.

Industry and Agriculture: 4-242, 4-506; railways, 4-242, 544; working elephants, 3-226; diamonds, 3-83; tea plantations, 4-240, 241. 1-276; cotton growing, 2-516.

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Babar and the Mogul empire, 5-238

rise and fall of Fr. power, 7-2; Clive

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and Seven Years' War, 2-411; Indian Mutiny, 4-252, 5-49; Brit. rule, 2-83, 4-239; Gandhi and passive resistance, 3-500; Mountbatten and partition, 5-288; republic, 2-84.

India Act (1784), terms of, 4-252.

Indiana, State of U.S.A.; area 36,291 sq. m.; pop. 3,934,224; cap. Indianapolis; 4-255.

Indianapolis, Cap. of state of Indiana, U.S.A., pop. 427,173; lay-out of town, 4-255.

Indian Carpets, 2-246, 252 illus. f.

Indian Congress, foundation (1885) and aims, 4-253; Muslims and, 6-39; Gandhi and Indian self-govt., 4-254; working committee of, 4-255 illus.

Indian Corn. See Maize.

Indian Elephant, tusks, 4-331.

Indian Empire, Order of the. Former order of knighthood, 4-418.

Indian Hemp. Drug produced from *Cannabis indica*; effects of drug, 4-161; as an anæsthetic, 1-142.

Indian Ink, 4-262; Ivory in, 4-331.

Indian Leaf Butterfly, 4-265 illus.

Indian Mutiny (1857-58), 4-252; siege of Lucknow, 5-19; letters in invisible ink, 4-262.

Indian Ocean. Area about 28,000,000 sq. m., 4-255, 5-494.

Indians, American. For Indians of Central and South America see **American Indians**; for Indians of North America, see **Red Indians**.

Indian Summer. (U.S.A.) Summer-like weather occurring in autumn.

India Office. Whitehall, London. Dept. of Brit. govt., estab. 1858 when control of India passed from East India company to Brit. crown. Abolished in 1917 when dominion status was granted to India and to Pakistan.

Indo-æ, in algebra, 1-107.

Indic Languages, defined, 4-115.

Indigestion, causes, 3-90.

Indigo. Blue dye obtained from the indigo plant, 5-256, 3-111, 112.

Indium (In). A soft white metallic element of extreme rarity and similar to gallium; atomic weight, 114.76; atomic no. 49; found in some zinc blends in minute quantities; melting point 156.4°C.; spectrum has two strong indigo-blue lines; 3-224, 1-116.

Indo-China. Peninsula of S.E. Asia comprising the three states of Vietnam, Cambodia, and Laos, formerly within Fr. Union; 4-256, 7-399; Siam's domination of, 7-47.

Indo-Chinese. Group of languages, 6-158.

Indo-European Languages, 6-158; and sub-groups, 4-445.

Indo-European Peoples, migrations of, 5-203.

Indo-Germanic Language. See **Indo-European Languages**.

Indomitable, H.M.S. Aircraft carrier, 5-346 illus.

Indonesia, Republic of, comprising the former Netherlands E. Indies, with the exception of Dutch New Guinea, 4-257; map, 4-258; flag, 3-385 illus. f.; Borneo, 2-18; Celebes, 2-286; Java, 4-355; Moluccas, 5-77; Sumatra, 7-187; birds and Wallace's Line, 1-456.

Indore. Former princely state of India (area 9,934 sq. m.), absorbed in Madhya Bharat, 4-239.

Indra. Deity in ancient Hindu belief, representing the air or the heavens; in later mythology overshadowed by other gods; 4-251.

Indri. Animal of Madagascar, known also as babakoto ("little old man"); belongs to the lemur family, 4-478.

Induction, in philosophy, 6-158; Bacon and, 1-340.

Inductance. The density of an electric or magnetic field, 3-216. Induction heating by high-frequency currents, 4-174. Electrostatic inductance is the process whereby an electric charge induces charges on nearby bodies. See also **Electromagnetic Induction**.

Induction Coil. A transformer (q.v.) with a few turns on the primary winding and a large number of turns on the secondary winding so that a

high secondary voltage is induced when the current in the primary is broken; 4-258.

Induction Motor. An alternating current motor in which currents in the primary winding set up a flux which causes currents to be induced in the windings of the rotor, so interacting to produce rotation of the latter. Sometimes called asynchronous motor. 5-276.

Inductor. In electricity, any piece of apparatus possessing the property of inductance (q.v.), 3-216.

Indulgences. In Rom. Cath. Church, remission of temporal punishment due to sin, after repentance has removed guilt; 2-380; Luther's attack on, 5-53.

Indus, r. of India rising in the Himalayas, 1,800 m. long, 4-259; anc. civilization in valley, 4-251; Lloyd barrage, 3-30 illus.

Industrial Alcohol, kinds and uses, 1-96, 7-137.

Industrial Design, careers in, 2-230.

Industrial Photography, 6-178 illus.

Industrial Psychology, National Institute of. Trained group of psychologists who apply science to the increase of business and industrial efficiency; 6-301.

Industrial Revolution, 4-259; child labour, 2-353; housing, 1-217.

Industrial Workers of the World. A labour organization established in U.S.A., 1905-1924. Advocated "syndicalism"—seizure of power by industrial workers through strikes, organized by one great union.

Inert Gases, valency, 2-317; in water, 3-329.

Infallibility, of Pope, 6-61.

Infante and Infanta. Titles of Sp. royal princes and princesses, respectively; portrait of Infanta Margaret Maria by Velazquez, 7-385.

Infantile Paralysis, or acute anterior poliomyelitis. A popular term now falling out of use. See **Poliomyelitis**.

Infantry (Ital *fanteria*, young footman). Soldiers who fight on foot; Assyrian, 1-339 illus.; in Brit. army, 1-248, 250; Brit. uniforms, 1-249 illus.; Brit. regimental colours, 2-165.

Infection, and bacteria, 1-344; how germs travel, 4-15.

Inferiority Complex. Term used in psychology to describe a feeling of inferiority for which the sufferer often overcompensates by boasting and aggressive behaviour.

Infield and Outfield System. In agriculture, 1-77.

Infirmity, of monastery, 5-244.

Inflation, of currency. Creation of an artificial purchasing power by over-circulation of notes above the gold cover, 5-231.

Inflected Languages, 4-145; Old English, 3-282.

Information, Central Office of. Brit. information service carrying govt. publicity campaigns and overseas news, also films and exhibitions; developed from former ministry of information.

Information, Ministry of. Brit. wartime govt. dept. which censored and distributed news and propaganda 1916-18 and during 2nd World War; terminated 1916; published books and pamphlets in many languages and sponsored films.

Infra-red Rays, 4-260; radiation and heat, 4-148; in physiotherapy, 6-192 illus.; and telescope, 4-261; wavelength of, 3-221.

Inge (Ing), William Ralph (1860-1954). Brit. divine; dean of St. Paul's Cathedral 1911-1931; a profound thinker, his unconventional and pessimistic views on modern tendencies led to his being styled the "gloomy dean." Wrote *Outspoken Essays*, *Lay Thoughts of a Dean*, and for many years a weekly article in the London *Evening Standard*.

Ingelow (In'jelo), Jean (1820-97). Brit. poet and novelist, remarkably popular in her time ("High Tide on the

INÖNÜ

Coast of Lincolnshire"; "Songs of Seven").

Ingersoll, Col. Robert Green (1833-99). Amer. lawyer, author, and orator; served in Civil War; chiefly remembered for his lectures and books violently assailing the Bible and Christianity.

Ingleborough. Mt. of the Pennine range, in Yorkshire (2,373 ft.); 6-118.

In'goldsby, Thomas. Pen-name under which the Brit. humorist, the Rev. Richard H. Barham (1788-1845), wrote the whimsical *In'goldsby Legends*; *Jackdaw of Rheims*.

Ingolstadt (Ing'olstaht), W. Germany. Town on Danube, 45 m. N. of Munich; pop. 29,840; soap, brushes, Ingrain Carpets, 2-249.

Ingrain Colours. Dyeing, 3-141.

Ingres (In'gr), Jean Auguste Dominique (1780-1867). Fr. portrait and historical painter, leader of classical school, in constant competition with Delacroix, leader of romantic school; wonderful draughtsmanship; 3-440. Holy Virgin at the Altar, 5-47 illus.; Oedipus and the Sphinx, 5-505 illus.

Inheritance, of land, in France, 3-431.

Initiative. Independent action in a self-appointed course of action; in politics, it means the power to create new legislation; in war it means the ability to make the enemy fight where and when one pleases (to lose the initiative means being forced by an enemy to fight when and where he chooses).

Injunction. A writ issued by the court ordering a person or persons to do or not to do a certain thing.

Ink, 4-261; for colour printing, 6-294; used on Egyptian papyrus, 2-1; pen, 6-112.

Ink'erman, Rus. Spt. vii. in s. Crimea near E. extremity of Sebastopol harbour, where Brit. and Fr. in 1854 defeated Rus. in Crimean War, 2-532.

Inkpen Beacon. Hill in Berks, Eng., 954 ft. high, 1-432, 3-111.

Inlaid Linoleum. Floor covering; how made, 4-516.

Inland Revenue, Board of, 4-52.

Inland Sea, Japan, 4-342.

Inn, r. rising in E. Switzerland, one of the chief tributaries of Danube; 320 m. long. Innsbruck on, 4-263.

Innerdowny Hill. Kilmorshire, Scot., highest summit of the Ochils (1,630 ft.), 4-412.

Inverleithen. Tn. in Peeblesshire, Scot.; pop. 3,622; mineral springs; 6-101.

Inner Mongolia. Autonomous region of China, 5-236. Huhhot (Kwail) replaced Ulan Hoto as cap., 1952.

Inner Temple. One of the two Inns of Court in the Temple, London, 5-21.

Inner Tubes, for tyres, 6-466.

Inniskilling. See **Enniskillen**.

Innocent III. Pope (1198-1216). Able and powerful Pope to whom King John of Eng. made submission, 4-378.

Innocent IV. Pope (1243-54). Estab. Inquisition in 1218, 4-263.

Innocent VII. Pope (1404-06). Pope in Rome during the Great Schism in the Catholic Church.

Innominate Bone, in skeleton, 1-144 diag.

Innsbruck. Cap. of Austrian Tirol. pop. 94,599; 4-263; Golden Roof, 1-324 illus.; market scene, 1-322 illus.

Inns of Court. Corporate bodies having the power to call law students, to the bar; in London there are four: Inner Temple, Middle Temple, Gray's Inn, Lincoln's Inn; 1-377.

Innuits. Native hunters of Alaska, 1-90.

Inoculation. See **Vaccination**.

Inönü (In'en'ü), Ismet (b. 1884). 2nd pres. of Turkish republic; life-long friend of Atatürk, he served in 1st World War and against the Greeks, taking his surname from his victory at Inönü in 1922; foreign minister in 1923, and premier until 1937; succeeded Atatürk as pres. (1938-1950), 4-397, 7-338.

Inoue (inoé'vâ). Kaoru, Marquis (1855-1916), Japanese statesman, a leader in reform movement which culminated in rev. of 1867; for 30 years no great issue in affairs was settled without his advice.

Inorganic Acids, nature; examples, 1-12.

Inorganic Chemistry. The study of chemical elements and their compounds other than compounds of carbon with the exception of the oxides and sulphides. These are generally included in inorganic chemistry.

Inquilina. An insect which lays eggs in nest of another insect, thus living as a parasite.

Inquisition. In Rom. Cath. church, 4-263; and Galileo, 3-499; Isabella and, 4-301; in Spain, 7-105.

In Salah. Tn. in Sahara desert, 6-485.

Insecta. Scientific name for insect or hexapod (six-legged) class of arthropods. See **Insects**.

Insecticides. Preparations for killing insects; fruit spraying, 3-480; and mosquito destruction, 5-93.

Insectivora. Order of mammals with teeth suitable for eating insects, 5-103.

Insectivorous Plants, types, 6-218, 217 illus. f.

Insects, 4-264; eaten by birds, 1-454; eggs, 3-173; Falbro's work, 3-335; as germ carriers, 4-15; mayfly, 6-150; Nature study, 5-338; pollination of flowers, 3-400; respiration, 6-389; sense of smell, 7-71. See also articles on separate insects.

Instep, of human foot, 3-412.

Instinct, and intelligence, in animals, 1-151.

Institute of Education. Organization for training teachers at London Univ., 5-33.

Institute of France. Fr. learned institution, for language, literature, art, science, etc.; foundation and composition, 1-9.

Insulator. Material that offers relatively high resistance to the passage of an electric current. Also, any appliance used to insulate a conductor from earth, or from another conductor, and often serving to support the conductor. Also, any material that does not conduct heat. Types of electrical, 3-211; asbestos, 1-263; glass fibre as, 4-32; mica as, 5-189; on grid pylons, 3-218; insulation of submarine cables, 2-152.

Insulin. An extract of the pancreas used in the treatment of diabetes, 4-270, 4-28; insulin shock treatment, 4-270.

Insurance, 4-271; fire insurance and early fire brigade, 3-301; Lloyd's, 4-532; careers in, 2-234, 236.

Insurance, Unemployment. Introduced into Gr. Brit. as part of the National Insurance Act, 1911, and extended by later Acts; provided compulsory insurance in certain grades and classes of labour against unemployment to which employers, employees, and the state contributed. Superseded in 1918 by National Insurance scheme and National Health service (qq.v.).

Intaglio. Engraving process in which the engraved object is hollowed out; in a cameo the engraved object is in relief, 3-292, 2-189; in sculpture, 6-519, in process engraving, 6-293.

Integers, whole numbers, in mathematics, 5-471.

Intelligence, and education, 3-166; and choice of career, 2-222; and instinct in animals, 1-154.

"Intelligence Quotient", and intelligence tests, 4-272.

Intelligence Tests, 4-271; answers to questions, 4-275.

Interdict. Church. Punishment by a Pope, bishop, etc., of a country, community or person; now rarely exercised.

Interest. In economics, 3-160.

Interest. See **Percentage and Interest**.

Interference of Light, 4-500 with diag.; interference colours, 2-463.

Interferometer. Instrument for measuring the wavelength of light, 4-500.

Interior Decoration, 2-117.

Interjection, in grammar, 4-55.

Interlaken [interlâ'kən] ("between the lakes"), Switzerland. Popular pleasure resort in Alps between Lakes Thun and Brienz, 25 m. S.W. of Berne; starting point for excursions to Lauterbrunnen and the Jungfrau, 1-126.

Interludes. In medieval drama, short play, 3-118.

Intermetallic Compound. In metallurgy, 1-115 with illus.

Intermezzo. See **Musical Terms** (list). **Internal-Combustion Engine**, 4-273; ethylene bromide as "anti-knock", 4-121; diesel engine compared, 3-88, 89; gas engine, 3-507; and road transport, 6-413.

International. The (in full, The International Working Men's Association). Three organizations which asserted rights of labour and aimed at international socialism. First International formed by Marx in 1866, ended 1872 in disagreement with anarchists. Second (Social-Democratic) International formed 1882 to unite political and trade union activities. Failure of 2nd International to prevent 1st World War resulted in formation of 3rd International (Comintern) to co-ordinate world Communist parties; disbanded in 1943 to strengthen Allied co-operation. See **Cominform**.

International Bowling Board, 2-29.

International Brigade. Military organization formed from foreign nationals to aid the anti-Fascist army in Spain. Civil War. Numbered about 30,000 men. Disbanded in 1938; 7-111, 4-476, 3-317.

International Cloud Atlas, and classification of clouds, 2-421.

International Court of Justice. Judicial body of the U.N., 4-459.

International Criminal Police Commission, work of, 6-253.

International Date Line, 7-278.

Internationals. The. Official socialist and communist song, was U.S.S.R. national anthem 1917-44. Music by Pierre Dreyer (d. 1932), words (French) by Eugène Pottier.

International Labour Organization, 4-464.

International Law. See **Law**, **International**.

International Lawn Tennis Championship. Played for Davis Cup, presented in 1900 by Dwight Davis, Amer. tennis champion, 4-461.

International Monetary Fund. Set up under the Bretton Woods agreement of 1944 to stabilise exchange and assist international trade, 3-419; and gold standard, 4-43.

International Red Cross Society. Founded 1870, 6-370.

International Settlement, at Shanghai, 7-16.

International Signal Code, used by ships at sea, 7-52 illus. f.

International Skating Union. Governing body for the world, 7-59.

Interregnum, Great. In Ger. history, the interval (1256-73) between the fall of the Hohenstaufen emperors and the election of the first Hapsburg.

Interrogative Adjectives. In grammar, 1-19.

Interrogative Adverbs. In grammar, 1-21.

Interval. See **Musical Terms** (list).

Intestines. In anatomy: digestive system, 3-90, 89 diag., 1-144.

Intolerance (1915). Famous film produced by D. W. Griffith; scene from, 2-388 illus.

Introverts, in psychology, 4-386.

Invalides, Les. Institution for wounded soldiers in Paris, 6-84; Napoleon's tomb at, 5-323 illus.

"Invar". A nickel-steel which expands very little when heated, 5-432; used for pendulums, 6-115.

Inveraray. Co. tn. of Argyllshire; famed for its forest; market-cross; memorial to Campbell hanged for share in rising of 1685; pop. 460.

Inverberrie (Scot.). See **Bervie**.

Invergordon. Tn. and spt. in Ross and Cromarty, Scot.; pop. 1,514; 6-453.

Inverlochy [inverlok'hî], Scot. VII. and castle ruin in Inverness-shire; here the Marquis of Montrose inflicted defeat on the Earl of Argyll's army, Feb. 2, 1645.

Inverness. Co. tn. of Inverness-shire, Scot.; pop. 28,115; 4-276; castle, 4-276 illus.

Inverness-shire. Co. of Scot.; area 4,210 sq. m.; pop. 84,924; 4-275.

Invertase. An enzyme; action in yeast plant, 3-294, 7-512.

Invertebrates. Animals which do not have jointed bodies or cartilaginous spinal columns.

Invert Sugar, 7-186

Inverurie. Tn. in Aberdeenshire, Scot., 1-3.

Investiture Contest, conflict between Papacy and Holy Roman Empire, 4-308.

Invisible College. Group of scientists, formed in 17th cent., forerunner of the Royal Society; Boyle and, 2-32.

Invisible Inks. See **Sympathetic Inks**.

Involuntary Muscles, in physiology, 5-298.

Io [i'ô]. In Gk. myth., maiden loved by Zeus and changed into a heifer to protect her from the jealousy of his wife, Hera; Hera, however, was not deceived, and tormented to until she was restored to her human form; Bosphorus legend, 2-21.

Iodine. Chemical element, one of the four halogens; atomic no. 53, atomic weight 126.92; melting point 113.5° C.; density 4.95 gm. per ml.; 4-276, 3-234, 4-121 as common antiseptic, 1-177; proved an element by Davy, 3-55; from seaweed, 1-105, 6-528; and thyroid deficiency, 4-28.

Iodoform. An antiseptic consisting of carbon, hydrogen, and iodine, 4-276.

Ion. Any atomic particle which carries an electric charge. It may be a free electron, an atom which has lost or gained one or more electrons, or a group of atoms with more or less than its full complement of electrons. See **Ions and Ionisation**.

Iona [i'ônâ] or **Icolmkill**. One of Inner Hebrides; 5 sq. m.; centre of Celtic Christianity; St. Columba and, 4-152; monastery, 1-227.

Ion'ia. In anc. geography, a dist. on the W. coast of Asia Minor and adjacent isls., settled by the Ionian Greeks.

Ionian Islands. Isls. of Greece, in the Ionian Sea. They consist of Corfu, Cephalonia, Zante, Leucadia, Ithaca, and numerous islets. Area 752 sq. m.; pop. 321,500; ceded to Greece (1861), 4-78; suffered severe earthquakes in 1953, 3-153.

Ionian Sea. The part of the Mediterranean between Greece and S. It.

Ionio. Anc. Gk. dialect, 4-71.

Ionio Bond. See **Electrovalence**.

Ionio Currents, 4-278.

Ionio Order of architecture, 5-532, 531 illus.; temple of wingless victory, 4-82 illus.

Io'nium. Radio-active element (I₀) having same chemical properties as thorium.

Ionosphere. Uppermost layer of the earth's atmosphere, extending from the higher limits of the stratosphere. It is strongly ionised (hence its name) by solar rays and cosmic radiation, 1-81, 4-277; affected by daylight and darkness, 6-344; and radio waves, 6-343 diag.; and ultra-violet rays, 6-339.

Ions and Ionisation, 4-276, 4-507; behaviour of salts, 4-455; behaviour in acid-base reaction, 1-12.

Iowa. State of U.S.A.; area 56,280 sq. m.; pop. 2,621,073; 4-278.

Iowa City, Iowa, U.S.A., former cap. of Iowa (1839-1857); pop. 27,212, 4-278.

Ipecacuanha [ipekak'uan'â]. S. Amer. plant of the madder family; used as an emetic.

Iphigenia [i'fîjénîâ]. In Gk. myth., daughter of Agamemnon; offered as sacrifice in Trojan War, but rescued

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by Artemis, taken to country of the Tauri where she became a priestess. Story subject of plays by Euripides, Racine, and Goethe; and Artemis, 1-67.

Ipswich, Co. of Suffolk; pop. 104,788; 7-182.

Iqbal, Sir Mohammed (1873-1938), Muslim poet and democratic philosopher; and Muslim League, 6-40.

Iquique [iké'ká], one of leading ports of Chile, in extreme N.; pop. 39,300; exports nitrate.

Iquitos [iké'tos], Trade centre of N.E. Peru on r. Amazon, at head of navigation for ocean vessels, 2,500 m. from mouth; pop. 40,000.

Iran. See Persia.

Iranic, Sub-group of languages including Persian, 4-415.

Iraq, Arab kingdom in Asia; area 116,000 sq. m.; pop. 4,799,500; cap. Baghdad; 4-278; map, 4-280; flag, 3-385 illus. f.; Euphrates, 3-306; under Turkish rule, 1-339; Turks expelled in 1918, 1-193, 7-483; anc. city of Ur, 7-369; treaty with Turkey, 7-337. See **Babylonia and Assyria** for anc. hist.

Irawadi, r., Burma; rises in N., flows s., 1,500 m. to Bay of Bengal, 2-130; rice crop, 6-397.

Irazu, Mt., Costa Rica, Volcano near Cartago, 11,320 ft., 2-515.

Ireland, John (b. 1879), Brit. composer; symphonic rhapsody "Mai-Dun"; Concertino "Pastorale"; songs, "Sea Fever," "Land of Lost Content."

Ireland, The smaller of the two main Brit. Isles; area 32,286 sq. m.; total pop. 4,329,000; 4-281; map, 4-282; physical features, 4-281; geological features, 3-88; shamrock emblem, 7-15; bagpipes, 1-317; hurling, 4-210; peatage, 6-106; potato blight and famine, 6-273.

HISTORY, St. Patrick and conversion to Christianity, 6-96; English rule in, 4-282; boycott and the Land League, 2-32; Parnell, 6-91; O'Connell and Catholic Emancipation, 5-499; Catholic Emancipation Act, 6-105; Dublin rising (1916), 3-130. See also **Irish Republic**; **Northern Ireland**; and names of chief cities and towns.

Ireland, National University of, Univ. of Irish Rep., founded in 1908 to take the place of the Royal Univ. of Ire.; it comprises the univ. colleges of Cork, Dublin, and Galway; faculties include science, arts, medicine, surgery, engineering.

Ireland, Northern. See **Northern Ireland**.

Irenaeus [irené'us], St. (c. 130-202). A Gk. Church father and martyr, bishop of Lyons; wrote a treatise in Greek against heresies.

Irene [iré'né] (752-803), Byzantine empress, first woman to rule Eastern Empire; originally a poor orphan, seized power in 780, on death of her husband, Leo IV; blinded and later murdered her son, Constantine VI; planned to unite Eastern and Western empires by marrying Charlemagne; deposed (802) and exiled.

Ireton, Henry (1611-51), Eng. soldier; son-in-law of Oliver Cromwell; he was a general in the Parliamentary army and one of the judges who condemned Charles I to execution.

Irgun [irgun Zval Lemni], Jewish terrorist organization; active in the Arab troubles 1936-39; during 1945-May 1948 committed outrages in attempt to force Brit. to set up Jewish state; outlawed by Israel on estab. of state, May 1948.

Iridesence, Rainbow-like play of colours; how caused, 4-500.

Iridium (Ir), A hard, brittle, white metallic element of the platinum group; atomic weight, 193.1; atomic no., 77; 3-223; used to tip gold pen nibs, 6-112.

Iris, In Gk. myth., rainbow goddess, messenger of gods.

Iris, Flower, 4-284.

Iris, Ring surrounding pupil of eye; sensitivity to light, 3-331.

Irish Free State, Former name of the Irish Republic, 4-284.

Irish Guards, A regiment of the Brigade of Guards, raised in 1900.

Irish Land League, and boycott, 2-32.

Irish Literature, 4-287 with illus.

Irish Moss, Type of seaweed, also known as carrageen, 6-528, 1-103, 5-273, 4-104 illus. f.

Irish Republic, Independent republic of the Brit. Isles, developed from the Irish Free State in 1949; area 20,001 sq. m.; pop. 2,958,878; cap. Dublin, 4-284; map, 4-282; flag, 3-384 illus. f.; agriculture, 4-285; government, 4-285; De Valera and independence, 2-81; Commonwealth relations, 2-84; police force, 6-252; universities, 4-283. See also **Ireland**; **Northern Ireland**.

Irish Romanesque, Type of art produced in Ireland during 8th and 9th cents.; illumination, 5-116.

Irish Sea, Body of water between England and Ireland, with North Channel at N. and St. George's at S.

Irish Setter, Large shooting dog; fine, long coat, usually bright red-brown; now seldom used for sport; 3-101 illus. f.

Irish Terrier. See **Dogs** (list).

Irish Wolfhound, Large dog, this breed resembles the deerhound.

Irkutsk [irkootsk'], Trade centre and largest city of Siberia near Chinese border and near s. end of L. Baikal; pop. 243,000; on Trans-Siberian rly.; 7-48.

Iron (Fe), Chemical element, atomic no. 26; atomic weight 55.85; 3-224, 5-177; and acids, 1-12; alloys, 1-114; as body builder in diet, 3-410; as magnetic material, 5-83, 85; melting point, 3-490; rust, 6-481, galvanized, 7-523. See also **Iron and Steel**.

Iron Age, In archaeology, the last of three stages (stone, bronze, iron); so named from the use of iron implements by people of the period; 5-109; in Brit., 2-73.

Iron and Steel, 4-288; alloys, 1-114, armour-plate, 5-181; Bessemer converter, 1-137, 4-294, 7-23; cast iron, 4-293; blast furnace, 1-482; smelting by coke, 2-117; iron ore and magnetism, 5-215; rolled steel joists for bridges 2-62; research, 4-296.

Iron Cross, Ger. decoration, 5-530.

Iron Crown, Jewelled gold crown, 6 ins. in diam., embodying iron circlet beaten out of a nail said to have been used in the Crucifixion; made for Agilulf, king of the Lombards, in 591; Charlemagne crowned with it, 5-19; also later emperors who were kings of Lombardy; Napoleon crowned himself with it in 1805; presented to Victor Emmanuel by the Austrians at Turin in 1860.

Iron Curtain, Physical and ideological barrier between Communist-controlled areas and the rest of Europe; term originated by Sir Winston Churchill in a private message to President Truman, 1915, but first used by him publicly at Fulton, Mo. 1916.

Iron Disulphide (iron pyrites, "fool's gold"), 7-187.

Iron Duke, The. See **Wellington Arthur Wellesley**, 1st Duke of.

Iron Gates, Point on Danube between Rumania and Yugoslavia, river hemmed in by mts., 3-48, 7-517.

Ironing, in laundries, 4-454, 455 illus.

Iron Lung, Device for applying artificial respiration, particularly in infantile paralysis.

Iron Mask, Man in tho., 4-296.

Ironmongers' Company, 4-526.

Iron Pyrites ("fool's gold," iron disulphide), 7-187.

Ironsides, (William) Edmund, Baron (b. 1880), Brit. gen.; c.-in-c. Allied Forces N. Russia (1918-19); gov. Gibraltar (1938-39); C.I.G.S., Sept. 1939; c.-in-c. Home Forces, May-July, 1940; Field-Marshal, July 1940; peer, 1941.

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Ironsides, Cromwell's troopers in the Civil War, 2-533; uniform, 1-249 illus.

Iron-wood, Popular name for several tropical trees, especially certain members of myrtle and ebony families whose timber is very hard.

Iroquois Cup, Annual lacrosse championship in Gt. Brit., 4-135.

Iroquois [irókwoi], Indians, or Five Nations, Confederacy of N. Amer. Indians formerly living in cent. and W. N.Y.; 6-371; position of women, 6-373.

Irradiation, The exposure of a body to X-rays, radium rays, or other radiation. Also, the phenomenon of the appearance of white or brightly coloured object on a dark background, when the objects appear brighter than they really are.

Irrawaddy. See **Irawadi**.

Irrigation, in Arizona, 1-239; Chinese water wheels, 2-374 illus.; in Israel, 4-302 illus.; in rice fields, 6-396; shadoof, 3-178 illus.; in the Sind plain, 4-259.

Irritant Poisons, types of, 6-236.

Irish [irish'], Important river of Russian Central Asia, a trib. of the Ob; length about 2,250 m.

Irving, Sir Henry (1838-1905), Brit. actor-manager; for 21 years was connected with Ellen Terry, with whom he acted in numerous Shakespearean and poetical dramas. First British actor to receive a knighthood.

Irving, Henry Brodribb (1870-1919), Eldest son of Sir Henry Irving; he played with George Alexander, and later took the name parts in *Hamlet* and *The Admirable Crichton*; for a time was manager of the Shaftesbury Theatre.

Irving, Laurence Brodribb (1871-1911), Second son of Sir Henry Irving, with whom he acted. Was drowned with his wife, when the *Empress of Ireland* went down May 29, 1911.

Irving, Washington (1783-1859), Amer. essayist, historian and writer of stories, 4-296; 2-354; *Rip Van Winkle*, 4-297; 7-364 with portrait.

Isaac, Heb. patriarch, son of Abraham and father of Jacob and Esau; and Abraham, 1-5.

Isaac I, Comnenus (d. 1061), Byzantine emperor, 1057-59.

Isaac II, Angelus (1185-95, 1203-61). See under **Byzantine Empire** (rulers).

Isaacs, Jorge (1837-95), Columbian writer, 7-101.

Isabella of Castile (1451-1504), Queen of Castile and wife of Ferdinand II of Aragon, 4-301; and Columbus, 2-467, 468, 1-132; Inquisition under, 4-263.

Isabella II (1830-1904), Queen of Spain; succeeded 1833; abdicated 1870; mother of Alfonso XII; 2-28.

Isabella of France (1292-1358), Queen of Edward II of England and daughter of Philip IV of France.

Isafjörður, Herring fishery centre of Iceland, 4-233.

Isaiah [iz'ia] (8th cent. B.C.), one of greatest of Old Testament Hebrew prophets; gives name to 23rd book of Old Testament, 6-296.

Isaleo, Mt. Volcano, Salvador, 6-493.

Isandhlwana [isandhlwahn'a], Hill in Zululand, S. Africa, nr. Tugela riv.; here a gallant stand was made by a small force of British and African troops against an overwhelming number of Zulus in 1879, 7-527.

Isar [izahr], r. rising in Tirol Alps in S. Bavaria, flows N.E. 219 m. to Danube; total fall, 4,816 ft.

Ischia [is'kia], Volcanic isl. of Italy 16 m. s.w. of Naples; 26 sq. m.; pop. 28,600; 4-315 illus.

Ischl [ishl], Austria, Celebrated resort, 28 m. S.E. of Salzburg; pop. 13,800.

Iseo [izé'o], Lake of. In N. Italy at s. foot of Alps; 15 m. N.W. of Brescia; formed by r. Oglio; 24 sq. m.; 4-304.

Isère, Tributary of r. Rhône, rising in Alps in S.E. Fr. and flowing S.W. 180 m.; 6-396.

ISEULT

Iseult (Isolt'), **Yseult**, or **Isolds**. Heroine of medieval romance *Tristan and Isolt*. See also *Tristan*.

Iseyin. Tn. in Nigeria, West Africa; pop. 48,000.

Isfahan or **Isfahan**. Tn. in Persia; pop. 192,000; 6-131, 133 illus.

Islerwood, **Christopher W. B.** (b. 1904). Brit. poet and novelist; collaborated with W. H. Auden in plays in verse, *The Ascent of P6*; *On The Frontier*.

Ishmael (Ish'mael). Son of Abraham and Hagar, Sarah's Egyptian hand-maid; ancestor of Ishmaelites (Arabs, according to Arab tradition); driven out with his mother and grew up in the wilderness; 1-5.

Ish'tar. Chief goddess of Babylonia, and Assyria, corresponding to Phoenician Astarte and Gk. Aphrodite.

Isidore (c. 500-588). Sp. writer; became Bishop of Seville (599); author of an encyclopedia; to him was falsely ascribed the authorship of the so-called Isidorian or False Decretals.

Isinglass. Substance obtained from the dried swimming bladders of fish, 4 301; from sturgeon, 7-171; and gelatine, 3-511.

Isiolo. Cap. of Northern prov., Kenya, 4-400.

Isla. In Eg. myth., goddess of the moon, 4 301; wife of Osiris, 6-6, 3-199; temple at Philae, 3 200.

Islis. Name given to the Thames at Oxford, 6-20, 7-263.

Iskanderun (formerly *Alexandretta*). Turkish seaport on the Mediterranean, 70 m. from Aleppo; capital of the sanjak of Alexandretta, now Hatay, made by the League of Nations in 1937 a separate entity, with full independence; pop. 13,900; ceded to Turkey June 1939.

Islam (Iz'lām). Arabic word meaning "pious submission to the will of God"; another name for Mahomedanism, and therefore for the whole group of Mahomedan peoples. See also *Mahomet* and *Mahomedanism*.

Islay. Smallest of the Inner Hebrides; pop. 240 sq. m.; 4-152.

Isles of the Blessed. See *Fortunate Isles*.

Islington. Met. bor. of London; pop. 235,645; 5-27.

Isma'il (Is'mī'el). **Pasha** (1830-95). Khedive of Egypt, son of Ibrahim Pasha; succeeded his uncle Said as viceroys (1863); by aiding the Sultan of Turkey secured direct succession of his line and title of khedive; improved economic condition of

WORLD'S LARGEST ISLANDS

	AREA IN SQ. M.
Australia (Island-continent) . . .	2,974,581
Greenland . . .	837,000
New Guinea . . .	300,000
Borneo . . .	290,000
Madagascar . . .	241,094
Baffin . . .	237,000
Sumatra . . .	185,000
Great Britain . . .	88,208
Honshu (Japan) . . .	87,500
Prince Albert Island . . .	80,000
New Zealand (South Island) . . .	58,093
Java (with Madura) . . .	51,032
New Zealand (North Island) . . .	44,281

Egyptians, but destroyed national credit; and Suez canal, 3 176.

Ismet Inönü. See *Inönü, Ismet*.

Isobars (Is'ohahrz). In barometric readings, lines connecting places with same barometric pressure.

Isochronism, pendulum's property of taking equal times for successive swings, 8-111.

Isocrates (Is'okratēs) (436-338 B.C.). Athenian orator and patriot; preached Gk. unity to resist Persia and was killed, according to Milton, by report of "that dishonest victory at Chaeronea, fatal to liberty."

Isolating Languages, defined, 4 145.

Isolds. See *Iseult*.

Isomers. In chemistry, 2-321.

Isometric Projection, form of perspective, 6-137, 138 illus.

Isongo (Is'onzō), r. in Yugoslavia and in N.E. Italy (formerly in Austria), rises in Alps and flows s. 75 m. to Gulf of Trieste; peace treaty with Italy in 1947 gave upper reaches, N. of Gorizia, to Yugoslavia.

Isoprene. Hydrocarbon found in rubber, 6 166.

Isoptera. Order of insects, including termites, 4-270, 7 239.

Isotherms. Lines drawn on a meteorological map through places having equal temperatures, 2 410.

Isotope. Atom of a particular element, having the same atomic number and almost identical chemical properties of that particular element, but differs in atomic weight or arrangement. Nearly all elements found in Nature are mixtures of several isotopes, 4 304; device for handling, 1 303.

Isfahan. See *Isfahan*.

ITALY

Israel. Jewish state in Palestine, 4-302, 6-48; and Egypt, 3-180; flag, 3-385 illus. f.; and Arabs, 1-193.

Israel. The name given to the northern kingdom of the Hebrews after the division into the two kingdoms of Israel and Judah, 4-374.

Israeli found. See *Money* (list).

Israelites. The 12 tribes of Israel, descended from the 12 sons of Jacob, 4-373.

Israels, Josef (1824-1911). Dutch painter, 5 384.

Issachar (Is'akah'r). Son of the patriarch Jacob, ancestor of the tribe of Issachar.

Issus (Is'sus). Anc. spl. of S.E. Asia Minor, of great strategic importance because of its position on the pass leading from Syria into Cilicia, battle of (333 B.C.), 1 98, 6 131.

Issyk Kul. Lake in Kirghiz S.S.R.; area 2,300 sq. m.; the name means warm lake; 4-413.

Istanbul. City and former cap. of Turkey on the shores of the Bosphorus; pop. 1,179,666; 4-303, map, 7-333, 334 illus.; Galata bridge, 2-68. For history see also *Constantinople*; *Byzantium*.

Istria. Peninsula at head of the Adriatic Sea, area 1,913 sq. m. Mostly Yugoslav territory.

Itagaki (It'agah'kei), **Taisuke**, Count (1837-1919). The "Ronssean of Japan"; helped to overthrow feudalism; established school to teach principles of govt. to the people; advocated constitutional govt. and founded first political party in Japan.

Italian East Africa. Former empire incl. Abyssinia, Eritrea, and It. Somaliland, 600,000 sq. m.; pop. (est.) 8,000,000; fell to Allies, 1941.

Italian Marionettes, 6 311.

Italian Quilting, type of embroidery, 3 239.

Italian Somaliland (Somalia). Former Italian colony. Since March 1950 admin. by Italy under U.N.; 7-81.

Italic Languages. Sub group of languages including Latin, 4-145.

Italic Type, used by Aldus Manutius, 1-98; based on Papal chancery style, 7-504.

Italy. Republic in S. Europe; area incl. Sicily, Sardinia and other islands, 116,000 sq. m.; pop. 46,737,701, 4-304; map, 4 305; flag, 3 384 illus. f.; Appennines, 1 180; earthquakes, 3-153; territories in Africa,

PROMINENT FIGURES IN ITALIAN LITERATURE

Vittorio Alfieri (1749-1803), dramatist "Sanl", "Oreste"; "Virginia"; "Timoleone."

Dante Alighieri (1265-1321), epic poet - "Divina Commedia" (Divine Comedy); "Vita Nuova" (New Life).

Gabriele D'Annunzio (1863-1938), poet, novelist, and dramatist - "Fedra"; "Il Trionfo della Morte" (The Triumph of Death); "La Città Morta" (The Dead City); "Francesca da Rimini."

Ludovico Ariosto (1474-1533), epic poet - "Orlando Furioso."

Giovanni Boccaccio (1313-75), poet and writer of short stories - "Decameron."

Roberto Bracco (1892-1943), dramatist and novelist - "Piccolo Santo" (Little Saint); "Donne"; "Maternità."

Tommaso Campanella (1568-1639), philosopher - "Civitas Solis" (The City of the Sun).

Giosuè Carducci (1836-1907), poet - "Hymn to Satan"; "Odi Barbare" (Barbaric Odes).

Benedetto Croce (1866-1952), philosopher - "Problemi di Estetica" (Aesthetic as Science of Expression).

Gracia Deledda (1873-1936), novelist - "La Madre" (The Mother).

Antonio Fogazzaro (1842-1911), novelist and poet - "Miranda"; "Lella"; "Danilo Cortis"; "Valsolda"; "Il Santo" (The Saint).

Giovanni Gentile (1875-1944), philosopher - "Teoria generale dello Spirito come Atto puro" (The Theory of Mind as pure Act).

Giuseppe Gioacchino (1847-1906), dramatist - "Come le Foglie" (Like Falling Leaves); "Tristi Amori" (Happy Love).

Carlo Goldoni (1707-93), comic dramatist - "La Bottega di Caffè" (The Coffee House).

Carlo Gozzi (1722-1806), dramatist "Turandot."

Giacomo Leopardi (1798-1837), poet - "La Ginestra."

Niccolò di Bernardo dei Machiavelli (1469-1527), essayist, and comic dramatist - "Il Principe" (The Prince); "Discorsi" (Discourses); "La Mandragola."

Alessandro Manzoni (1785-1873), novelist and poet - "Il Cinque Maggio" (The Fifth of May); "I Promessi Sposi" (The Betrothed).

Giambattista Marino (1569-1625), poet - "Adone."

Vincenzo Monti (1754-1828), dramatist and poet - "Aristodemo"; "Bassavillana."

Alfredo Panzini (1863-1939), biographer and critic - "Le Fiabe della Vittoria"; "Piccolo Storia di Mondo Grande."

Giovanni Papini (1881-), philosopher and critic - "Storia di Cristo" (Life of Christ); "Un Uomo Finito" (A Man Finished).

Giuseppe Parini (1729-99), poet - "Il Giorno" (The Day).

Giovanni Pascoli (1855-1912), poet - "Myricae"; "Poemetti"; "Poesie Varie."

Francesco Petrarca (1304-74), poet - "Sonnets."

Luigi Pirandello (1867-1936), dramatist - "Sei Personaggi in Cerva d'Autore" (Six Characters in Search of an Author).

Matilde Serao (1856-1927), novelist - "Il Paese di Cuicagna" (The Land of Cockayne).

Ignazio Silone (1900-), novelist and essayist - "Fontamara"; "Mazzini."

Torquato Tasso (1544-95), epic poet - "Aminta"; "Gerusalemme Liberata" (Jerusalem Delivered).

Giovanni Verga (1840-1922), novelist - "Mastro Don Gesualdo"; "Cavalleria Rusticana" (Rustic Chivalry).

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1-55; Tiber, 7-272; South Tirol, 7-281; malaria, 5-91; natural gas production, 5-331; fireworks, 3-304. *See also* names of chief cities.
History: 4-305, 3-314; the Etruscans, 3-305; Roman history, 6-429; early banks, 1-363; embassies, 1-131; Renaissance, 6-381; medieval Florence, 3-303; Milan, 5-205; Ravenna, 6-368; Garibaldi's campaigns, 3-501; Mazzini, 5-151; Sardinia as nucleus of Kingdom of Italy, 6-199; abolition of Inquisition, 4-263; and Dalmatia, 3-29; in First World War, 7-480; Fascism, 3-341, 7-484; Mussolini's rule, 5-310 and Abyssinia, 1-7, 7-185; in Libya, 1-53, 4-489; 2nd World War, 4-78, 7-488, 491, 495 illus., 496, map 498; submarine losses in Atlantic, 1-295; for history of city-states *see also* entries **Florence**; **Genoa**; **Venice**, etc.
Italy, Art of, 4-317; compared with Dutch painting, 5-383; It. puppet theatres, 6-308; painting, 6-33; Renaissance art, 6-386, 4-313. *See also* names of chief It. artists.
Italy, Literature, 4-329; Dante's influence on language, 3-16; drama, 3-119; Florence and the Renaissance, 4-313; Italian opera, 5-513; It. language, 4-149.
Italy Star. Brit. medal, instituted May 1915, for military service in Sicily or

Italy between June 11, 1913, and May 8, 1915; medal ribbon of the It. colours, green, white, and red.
Itasca, Lake, Minnesota, U.S.A., source of Mississippi riv., 5-225.
Ith'aca, Isl. of Ionian group, Greece; 40 sq. m.; legendary home of Odysseus, 7-320; suffered severe earthquake in 1953.
Ito (伊藤), **Prince Hirobumi** (1841-1909), Japanese statesman and leading reformer, 4 times premier; drafted constitution of 1889; assassinated.
Iturbide, Augustin de (1783-1824), Spaniard who proclaimed himself Emperor of Mexico in 1822, 5-188.
Ivan III, Emperor of Russia (1462-1505); rule, 6-174.
Ivan IV (1530-81), the Terrible, Tsar of Russia, 1547-84; 4-331, 6-471.
Ivanhoe. Novel by Sir Walter Scott, 5-153, 6-116.
Ivanovo-Voznesensk [évahnóv'vóznescensk'], Soviet Russia. Mfg. tn. on r. Uvod 160 m. N.E. of Moscow; pop. 285,000.
Ives, Frederic Eugene (1856-1937), Amer. inventor; originator of the half-tone process of photo-engraving and also of the three-colour process of colour printing.
Iviza [évéthah], One of the Balearic Isles; area 230 sq. m.; pop. 25,000; 1-349.

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Ivola. Lapp town in Norway destroyed by Gers. in 2nd World War, 4-147.
Ivory, 4-331; hunting elephants for ivory, 3-227; Jap. ivory work, 4-352, 351 illus.
Ivory Coast. A region of Fr. W. Africa; area 123,310 sq. m.; pop. 2,221,000; chief tn. Abidjan; dense forests; palm products; rubber; 7-140.
Ivy. Climbing evergreen shrub, 4-332.
Iwakura [évahnkó'ral], **Prince Tomomi** (1835-83), Jap. statesman; leader in movement to abolish feudalism.
Iwasa Matahei (1577-1650), Jap. artist; and Ukiyoe school, 4-353.
Iwo. Tn. in Nigeria, W. Africa; pop. 100,000; 5-435.
Iwojima [évóhó'mal], Central Is. of the three Volcano Is., Pacific Ocean, 775 m. from Japan; Jap. air base in Second World War; taken by U.S. marines during Feb. and March 1945 with great loss of life to both sides; 7-498.
Ixion [iks'yon]. In Gk. myth., father of the Centaurs, who for attempting to win the love of Hera was bound for ever to a rolling fiery wheel.
Ixtacihuatl. Extinct volcano in Mexico, 40 m. S.E. of Mexico City; about 17,000 ft. high; 5-187.
Iyematsu period (1622-40) of Jap. art; perfume box, 4-353 illus.
Izmir. *See* Smyrna.

J

LIKE C and G, and U and V, the letters I and J were originally forms of the same letter. The vowel sound *i* and the consonant sound *j* were both represented by I until about the 15th century. Then some of the monks who worked on the beautiful illuminated manuscripts of that time used to lengthen the letter I and curve it toward the left when it began a word, thus making of it an ornamental initial. Gradually this form

came to be used entirely to represent the consonant sound while the old form was retained for the vowel sound. This consonant sound was originally like our *y*. Thus *Julius* in Latin was pronounced as though it were spelt *Yulius*. The sound we give it in English, *dzh*, like our soft *g*, came to us from the Old French. In modern French it is pronounced with a still softer sound like *zh*. In German and some other tongues it is still pronounced *y*.

Jabalpur. *See* Jabulpore.
Jabiru. Genus of large birds of the stork family, native to Indian sub-continent, Africa, S. Amer., and Australasia. Height up to 5 ft. Large bill. Head and neck almost bare. Colour, black and white.
Jacaranda Tree, in Pretoria, 2-286.
Jacinth (hyacinth), orange-red variety of zircon, 7-523.
Jack (fish). *See* Pike.
Jackal. Animal, relative of the dog, 4-333.
Jackass. Male of the domesticated ass or donkey.
Jackdaw. Bird, member of the crow family, 4-333; egg, 1-152 illus. f.
Jack-o'-lantern, or Will-o'-the-wisp. *See* Ignis Fatuus.
Jack Snipe. Bird, smaller than the common snipe species, 7-76.
Jackson, Andrew (1767-1845), 7th pres. of U.S.A.
Jackson, Sir Barry Vincent (b. 1879), Brit. theatre manager; founded repertory company in Birmingham in 1913, 1-473.
Jackson, Charles Thomas (1805-80), Amer. scientist; worked on anaesthetics with W. T. G. Morton, 1-142.
Jackson, John (1769-1845), Brit. pugilist, nicknamed Gentleman Jackson. Champion 1795-1803, easily defeating Mendoza. Opened a school of boxing in London. Byron being one of his pupils, 2-30.
Jackson, John Hughlings (1835-1911), Brit. neurologist; did research on epilepsy; pub. many works on the nervous system, 5-166.
Jackson, Thomas Jonathan ("Stonewall," 1824-63), Amer. Confederate general in Amer. Civil War, 4-333.
Jackson. Cap. of Mississippi state, U.S.A.; pop. 97,674; 5-227.

Jackstaff. *See* Nautical Terms (list).
Ja'cob. Hebrew patriarch, 2nd son of Isaac, planter of his brother Esau's husband of Leah and Rachel and progenitor of Israelites (Gen. xxv. 1); and story of Joseph, 4-373, 4-383.
Jacobins. Club of Fr. Rev. period, 4-334, 3-451; and mob support, 3-468; Marat and, 5-120; Robespierre and, 6-115.
Jacobites. Adherents of James II and his descendants after 1688, 4-334; 1745 rebellion and Brit. national anthem, 5-325; Scot. supporters, 6-512; the little gentleman in black velvet, 5-231.
Jacobs, Helen Hull (b. 1908), Amer. tennis player; Wimbledon Ladies' Singles champion, 1936, and reached final on 5 other occasions; 4 times ladies singles champion of U.S.A.
Ja'cobs, William Wymark (1863-1913), Brit. writer; celebrated for his quaintly humorous stories, many of which deal with seafaring characters (*Many Carques*; *The Skipper's Wooing*; *A Master of Craft*; *At Sunnich Port*; *The Monkey's Paw*).
Jacob's Ladder. Greek Valerian, or Charity, Herbaceous perennial plant native to N. temperate and Arctic regions. Height up to 3 ft. Leaves divided featherwise. Flowers blue or white, drooping.
Jacobus Jonker Diamond, 3-85, 82 illus.
Jacquard Loom. Invented by Joseph Marie Jacquard (1752-1834) of Lyons, Fr., 4-335, 1-321; lace-making, 4-432 illus.; 7-135.
Jacques Cartier Peak. Mt. in Notre Dame range, Quebec, Canada (4,300 ft.), 6-321.
Jade. Precious stone, 4-336, 7-164.
Jadeite, or Chinese jade; most valuable kind of jade, 4-336.

Jaël [jæl]. Hebrew woman exalted in the Song of Deborah (Judges v) because she killed Sisera, leader of the Canaanites.
Jaffa. *See* Tel Aviv-Jaffa.
Jagannath [jagahnath]. Former name of Puri town in Orissa, India. *See* Juggernaut.
Jagellon [yagel'on]. Famous royal family whose members for two centuries ruled in Lithuania, Poland, Hungary, and Bohemia.
Jagger, Charles Sergeant (1885-1934), Brit. sculptor; his work included Royal Artillery Memorial, London; British Memorial to Belgium, Brussels; 6-523 illus.; Shackleton memorial, 7-10 illus.
Jaguar. Animal, largest species of American spotted cats, 4-336 with illus. f., 2-45 illus.; compared with leopard, 4-484.
Jah. A variation of Jehovah.
Jainism [jân'izm; jû'izm]. Religious system in India, founded by Vardhamana Mahavira, a contemporary of Buddha; 4-212.
Jaipur [jî'poor] or **Jeypora.** Div. and dist. of Rajasthan, Rep. of India; pop. (div.) 5,838,011; (dist.) 1,656,887; chiefly agricultural; some marble, copper, and cobalt found.
Jaipur. Cap. of Rajasthan state, India; pop. 175,810; mfrs., gold and enamel ware, carpets, muslin, jewelry; 4-241; "City of the Winds," 4-247.
Jajce, Yugoslavia. Tn. 65 m. N.W. of Sarajevo; chief outpost of E. Christendom from 1463 until captured by Turks in 1828.
Jakarta (formerly Batavia). Spt. on N. coast of Java, cap. of Rep. of Indonesia; exports coffee, sugar, tea, rice, spices; pop. 260,000; 4-355, 4-258; scene, 4-356 illus.

JAKOVA

Jakova or **Djakova**. Tn. in Montenegro, Yugoslavia; pop. 12,000; 5-250.
Jalalabad. Tn. in Afghanistan, on the Kabul r., 80 m. E. of Kabul. Pop. 14,800.
Jalap [Jo'lap]. A perennial twining plant (*Ipomoea jalapa*) with large flowers; grows in Mexico near the tn. of Jalapa, whence its name; the root contains a resin used in purgatives; relative of Morning Glory.
Jalisco [hale'skō]. Mexico. State on cent. w. coast; 31,000 sq. m.; pop. 1,418,300; cap. Guadalajara; corn, wheat; cattle; iron and silver.
Jama. A preserve, 4-336.
Jamaica. Isl. of Brit. W. Indies; area 4,411 sq. m.; pop. 1,416,987; cap. Kingston; 4-337; banana cultivation, 1-380.
Jamaica Pepper. *See* Pimento.
Jama Masjid. Great mosque at Delhi, India, 3-66.
Jamb, in architecture, the upright sides of an aperture, as a window, doorway, or fireplace, supporting the lintel, entablature, or mantel.
Jamboree. International Boy Scout camp. Term is a N. Amer. Indian word meaning a carousal; 2-37.
James, St., the Elder. Son of Zebedee, brother of John; patron saint of Spain, 1-184; scallop shell emblem, 6-502.
James, St., the younger. Son of Alphaeus; one of the 12 Apostles, 1-184.
James, the Lord's brother. Traditional author of Epistle of James.
James I (1566-1625). King of Gt. Brit., 1603-25, 4-338; portrait, 4-339 illus.; union of crowns of Eng. and Scot., 3-277, 6-512; granted charter for settlement in Amer. (1606), 7-403; and Bacon, 1-310; and Robert Cecil, 2-285; and Raleigh, 6-362.
James II (b. 1633; reigned 1685-88). King of Gt. Brit., 4-339, 3-280; battle of the Boyne, 2-32; Irish support for, 4-282; and Judge Jeffrey, 4-359; and Marlborough, 5-132; estab. Order of the Thistle, 7-270; and the Jacobites, 4-344, 6-512; statue by Gibbons, 4-19.
James I (1394-1437). King of Scot., poet and constitutional reformer; succeeded in 1408, while captive in Eng., released in 1424; murdered by rebel nobles.
James II (1330-80). King of Scot., son of James I; succeeded to the throne at the age of seven; the Earl of Douglas, who was regent, was murdered by James, who was himself killed when besieging Roxburgh Castle, Aug. 3, 1460.
James III (1451-88). King of Scot.; a weak ruler, the nobles rose in arms against him, and he was murdered when fleeing from Sauchieburn, after defeat of his army, 1-365.
James IV (1473-1513). King of Scot.; succeeded in 1488; figures in Scott's *Lady of the Lake*; killed at Flodden, 3-389.
James V (1512-42). King of Scot.; succeeded in 1513; father of Mary Queen of Scots, 5-111.
James VI of Scotland. *See* James I (Gt. Brit.).
James (James Edward Francis Stuart) (1688-1766), the "Old Pretender"; and Bolingbroke, 1-506; 1715 rebellion, 4-354.
James, Epistle of. Book of the New Testament, ascribed to James the Lord's brother; sent from Jerusalem to twelve tribes of the Dispersion, inculcating practical morality.
James, Henry (1843-1916). Amer. novelist and essayist; Brit. subject (1915); refined, subtle, and perceptive, but in later works becoming involved and artificial stylist; influence of Turgenev, 5-473, 8-291; 7-365; portrait, 7-366 illus.
James, William (1842-1910). Amer. psychologist; brilliant, original and highly readable philosopher (*Principles of Psychology*; *Varieties of Religious Experience*); and Pragmatism, 6-159.

Jameson [Jam'son], Sir Leander Starr (1853-1917). Brit. physician, leader of "Jameson raid" on the Transvaal (1895-96), 7-93, 1-509; became leader of S. African Progressive party and prime minister (1904-08) of Cape Colony; Rhodes and, 6-393.
James Tait Black Prizes. Two annual Brit. literary money prizes, for fiction and biography, first awarded 1919; founded by Mrs. Black to commemorate J. T. Black, publisher; won by E. M. Forster, J. B. Priestley, Graham Greene, P. A. Scholes, etc.
Jamestown, Virginia, U.S.A. First permanent settlement made by Eng. in Amer.; pop. 1,352; 7-403.
Jammu. Winter cap. of Kashmir; pop. 36,500; 4-394; Jammu and Kashmir is the full name of the state of Kashmir.
Jammu and Kashmir. *See* Kashmir.
Jamshedpur. Tn. in Bihar state, India, pop. 148,711; greatest iron and steel centre of India; 1-445.
Jane, Fred T. (1870-1916). Brit. naval writer and novelist; founded in 1898 the annual *All the World's Fighting Ships*.
Janiculum [Janik'ulum]. Anc. name of hill in Rome.
Janina [yah'nēna] or **Yanina**. Tn. in N.W. Greece; pop. 20,000; taken from Turkey (1913); makes gold ware, silks.
Janissaries [Jan'isariz]. Military force conscripted from Christian subjects of Turkish Empire; suppressed (1826) by Mahmud II, 7-333.
Jan'sen or Jansen's, Cornelius (1585-1638). Dutch theologian, Bishop of Ypres, founder of Jansenism.
Jan'senism. A doctrine intended to reform R. Catholicism, defended by Pascal but condemned by several popes as heresy; it rent France in 17th and early 18th centuries; Racine and, 6-334.
Januarius, St. Patron saint of Naples, Italy; legend, 3-317.
January. First month of the year; origin of name, 5-255.
Janus. Two-faced Roman god; January named after, 5-255.
Japan. Kingdom of E. Asia, consisting of the Isls. Honshu, Hokkaido, Kyushu, Shikoku, and numerous smaller islands; area 141,329 sq. m.; pop. 89,269,278; cap. Tokyo; 4-340; map, 4-341; flag, 3-345 illus. f.; physical features, 4-341; national character, 4-343; effect of climate on population, 1-268; chrysanthemum as imperial symbol, 2-384; children, 2-211 illus.; origin of folding fan, 3-339; firefly festivals, 3-364; marriage customs, 5-134 illus.; New Year customs, 5-410; octopus fishing, 3-13.
Agriculture and Industry: Products, 4-342; industrial expansion and cheap labour, 4-343; minerals, 4-343; railways and shipping, 4-343; pearl diving, 6-103 illus.
History: Conquests in Asia and beginning of trade with west, 1-272; war with China, 4-349, 7-484; former possessions in Pacific, 4-340, 341, 6-32; and League of Nations, 4-464; Manchukuo, 5-112, 7-484, and modern China, 2-375; attack on Pearl Harbour, 6-100, in 2nd World War, 1-514, 7-491, 493-494, 496, 499 with map, atomic bombs attack, 1-303; MacArthur and reform of Jap. govt., 5-58.
Japan, Sea of. Part of Pacific Ocean between Japan and Asia, 6-26.
Japan Current. Warm current of the Pacific Ocean, 5-498 and Alaskan climate, 1-89.
Japanese Art, 4-351; symbolic dances 3-41 illus.; lacquer work, 4-434.
Japanese Cypress. Tree, 4-342.
Japanese Laurel. Variety of laurel, 4-455.
Japanese Peacock, Bird, 6-100.
Japanning. Form of lacquer work first practised by Japanese, 4-434.
Japhet. One of Noah's sons in the Biblical story, 5-445.
Japonica. Variety of camellia, 2-189.
Japura. *See* Yapura.

JEFFREYS

Jaques-Daleroze, Émile (1865-1950). Swiss composer and teacher; inventor of eurythmics, 3-307, 3-40.
Jar. Unit of capacitance formerly used in the Royal Navy. It is equal to 1,000 electrostatic units, or 0.001 microfarad. Called after the Leyden jar (q.v.).
Jarcon. A variety of the mineral zircon, especially the colourless or smoky zircons from Ceylon, 7-523.
Jarrah. Dark-coloured close-grained wood of the Australian tree *Eucalyptus marginata*. Used for piles for bridges and street paving blocks.
Jarrow. Tn. of Durham co., Eng., on the r. Tyne; shipbuilding yards, steel-rolling, asphalt preparation, pop. 28,541; here are ruins of the monastery in which the Venerable Bede lived and died; 5-394.
Jarvis, John. Dwarf who served as page to Mary I of Eng., 3-140.
Jasmine. A garden shrub, 4-354.
Jason. Legendary Gk. hero, leader of the Argonauts in winning the Golden Fleece, 1-226; and Medea, 5-159.
Jasper. A coloured variety of quartz, varies from reddish brown to brownish black. Takes a high polish, 6-320, 7-53.
Jasper National Park. Alberta, Canada. Mt. resort and wild life sanctuary; area 4,200 sq. m.; 1-94 illus., 2-190 illus. f.
Jasper Ware. Variety of Wedgwood pottery with white figures on a blue background, 6-276 illus.
Jassy. Tn. of Rumania, pop. 109,000, 6-470.
Jaundice. Disease of the liver, 4-524.
Jaunpur [Jawnpoor']. A city in Uttar Pradesh, N.E. India, on r. Gumti, 34 m. N.W. of Benares; pop. 41,800; once a magnificent Mahomedan capital; famous for perfumes.
Java. Isl. of the Rep. of Indonesia; area (with Madura) 51,032 sq. m.; pop. about 50 million; 4-355, 4-257, 258; batik-printing, 3-111; religious dancing, 3-42, 13 illus.; quinine production, 6-325 illus.
Javanese. A people of eastern Java 4-355.
Javan Rhinoceros, 6-392.
Javelin. Throwing in athletics; standard performances, 1-290, 292, 291 illus.
Jaw, bandage for fracture, 3-366 with illus.
Jaxartes [Jaksahr'tēzi]. Anc. name of Syr Daria, r. in cent. Asia; flows N.W. to Aral Sea; Alexander conquers Scythians, 1-99.
Jay. Bird, 4-357, 1-407 illus., etc.; 1-452 illus. f.
Jazz. Music which originated in New Orleans, U.S.A., 4-357, 5-100.
Jeanneret, Charles Édouard. *See* Le Corbusier.
Jeans, Sir James Hopwood (1877-1946). Brit. physicist, astronomer, and mathematician, 4-358; and theory of planet formation, 6-214.
Jebel Uduim. (Hill of Sodom). Rock salt hill on shores of Dead Sea, 6-19 illus.; and story of Lot, 3-55.
Jed, r. of Scot., 4-460.
Jedburgh. Co. tn. of Roxburghshire Scot.; pop. 4,083; abbey, 6-460.
Jeddah. Port of Hejaz, Saudi Arabia pilgrim traffic, 1-191.
Jesp. Popular name of a general purposes (G.P.) U.S. army vehicle.
Jefferies, (John) Richards (1845-87). Brit. writer on Nature and wild life. Wrote *The Gamekeepers at Ham* (1878), *Wood Magic* (1887), *Beris, the Story of a Boy* (1882).
Jefferson, Thomas (1743-1826). 3rd pres. of U.S.A., 1801-09, 4-358; draft of Declaration of Independence, 1-138 illus.
Jefferson City. Cap. of Missouri state U.S.A.; pop. 24,090; 5-227.
Jeffrey, Francis Jeffrey, Lord (1773-1850). Brit. lawyer; co-founder and editor of *Edinburgh Review*; merciless critic of Romantic movement.
Jeffreys, George, Baron (1848-89). Eng. judge, chief justice and late lord chancellor under James II; notorious for brutality in "bloody assize" following Monmouth's in-

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urrection; 4-358; and deportation of convicts, 6-291.
Jeffries, John (1744-1819). Amer. balloonist; Channel crossing, 1-354.
Jehangir (1600-1627). Mogul emperor; receives first Brit. ambassador, 4-252 illus.
Jehann. See **Jehum**.
Jehoshaphat. Son of Asa and king of Judah, 9th cent. B.C.
Jehoshaphat, Valley of. A place mentioned in the Bible; supposed to be between Jerusalem and Mount of Olives.
Jehovah (more properly Yahweh) or Jah. Hebrew name for the God of Israel; means the "self-existent" or "unchangeable One"; in English versions generally rendered "the Lord."
Jehu (Jē'hū). King of Israel; killed Jezebel and massacred house of Ahab (2 Kings ix-x), enemy of Baal worshippers; furious driver (2 Kings ix, 20).
Jekyll, Dr. See **Dr. Jekyll and Mr. Hyde**.
Jellicoe, John Rushworth Jellicoe, Earl (1859-1935). Brit. sailor 4-359; at Jutland, 4-390.
Jelly-fish. A primitive coelenterate animal, 4-360; protective coloration, 6-296.
Jemappes (zhemap'pē). Vill. in Belgium, 3 m. s.w. of Mons; decisive defeat of Austrians by Fr. in 1792.
Jena (yā'nā). Ger. Famous univ. tn. of Thuringia on r. Saale 45 m. s.w. of Leipzig; pop. 58,000; lens-making industry, 4-482; battle of Jena (1806) in Napoleonic Wars, 5-320.
Jena, University of. One of the chief Ger. univs., founded about 1517; noted for its many distinguished teachers, including Fichte, Schelling, Hegel, Schiller, Haackel, and Eucken; identified with liberal movement in theology.
Jenghiz Khan (1162-1227) Mongol emperor; conquests, 5-237, 5-247, 7-427; conquest of Persia, 6-132.
Jenkins's Ear, War of. Robert Jenkins, Brit. merchant sea-captain, appeared before the House of Commons and alleged that the Spaniards had boarded his vessel and cut off his ear. The incident led to war between Eng. and Spain in 1712 and to the downfall of Walpole.
Jenner, Edward (1749-1823). Brit. physician, originator of smallpox vaccination, 4-360.
Jennings, Sarah. See **Marlborough, Duchess of**.
Jenson. An old printing type revived by Monotype Corporation, 5-248.
Jephthah (Jē'fthā). Judge of Israel who, in fulfillment of a rash vow, sacrificed to the Lord the first creature that he met on return from victory—his only daughter (Judges xi).
Jerba. Fr. isl. off E. coast of Tunis, N. Africa; 425 sq. m.; pop. 90,000, mostly Berbers; the lotus-eaters' isl. of Gk. and Rom. geographers.
Jerboa. A desert rodent, 4-361.
Jeremiah (7th cent. B.C.). One of the major Hebrew prophets, last before the exile; Book of Jeremiah is one of the greatest and longest of the Old Testament prophetic books; 6-296.
Jeréz (or Xerez) de la Frontera (hā-rāth dā lah frōntā'ra). Spain. Old city in s. 14 m. N.W. of Cadiz; pop. 93,000; famous for sherry, to which it gave the name.
Jericho (Jē'rikō). Important city of anc. Palestine 7 m. N. of Dead Sea; miraculously captured and almost destroyed by Joshua (Josh. vi. 20-4); 6-48.
Jeroboam I, leader of rebellious 10 tribes and first king of Israel (10th cent. B.C.) after separation from Judah (1 Kings xii, 20); 4-374.
Jerome, St. (c. 340-420). Most learned of early Fathers of Latin Church; Turner's engraving of, 3-138 illus.; and Vulgate Bible, 1-442.
Jerome of Prague (d. 1416). Learned

and eloquent Bohemian religious reformer and friend of John Huss.
Jerome (Jē-rōm'). **Jerome K.** (1859-1927). Brit. humorist and dramatist, who won success originally with his *Three Men in a Boat*; with Robert Barr he founded *The Idler*; (*Idle Thoughts of an Idle Fellow*; *The Passing of the Third Floor Back*).
Jersey. Largest and southernmost of the Channel Isls., 12 m. from France; area 45 sq. m.; pop. 59,296; cap. St. Helier, 2-302.
Jersey Cattle. Breed originating in Isl. of Jersey, 2-274, 275 illus.
Jersey City, New Jersey, U.S.A. Mfg. city on Hudson r., opposite New York; pop. 290,017; rly. centre, with large trade in coal, iron, agriculture; extensive meat packing business; 5-398.
Jerusalem. Anc. cap. of the Jews, now divided between the states of Israel and Jordan; pop. 191,000; 4-361, 4-302, 6-48; Solomon's temple, 7-84; David and, 3-54; captured by Nebuchadnezzar, 4-375; Jesus in the Temple, 4-363, 364 illus.; destroyed by Romans (A.D. 70). 6-45; Crusaders and their kingdom, 3-1; captured by Saladin, 6-488; captured in 1st World War, 1-112 with illus., 7-481.
Jerusalem Artichoke (*Helianthus tuberosus*), 1-257 with illus.
Jervis Bay. Spt. of Australia; naval college, 1-319.
Jervis (Jarvis) Bay, H.M.S. Brit. armed merchant cruiser and escort vessel; commander, Capt. E. S. F. Fegen (posthumous V.C.); sunk Nov. 5, 1940, on escort duty, while engaging Ger. pocket battleship *Adm. Scheer* so that the convoy might escape, 6-350.
Jessamine. See **Jasmine**.
Jesse. Father of David; "the tree of Jesse," a favourite medieval Church emblem, represents Jesse as the root, and the Saviour or Virgin and Child as the supreme flower (Isaiah xl. 1, 10), 3-53.
Jesses. In hawking, leather strips attached to bird's legs, 4-111.
Jessop, Gilbert Laird (1871-1955). Eng. cricketer; captained Glos. team and was particularly famous for his mighty hitting in early years of 20th cent.
Jesuits, or Society of Jesus. Religious order founded by Loyola and Navier, 5-46 7-506; and Counter-Reformation, 6-377; expelled from Abyssinia, 1-6.
Jesus Christ. Founder of Christianity, 4-363, 2-379; date of birth and calendar, 2-174, 2-381; birthplace at Nazareth, 5-339; and St. Peter, 6-145; seamless garment, 4-418; and the Wandering Jew legend, 7-418.
Jesus College, Cambridge University. 2-182.
Jesus College, Oxford Univ.; foundation, 6-18.
Jet. A dense black lignite, sometimes used for jewelry; easily cut and carved; takes a high polish. Best comes from Whitby, Yorks; also mined in Fr., Ger., and Spain.
Jet Aircraft; development after 2nd World War, 1-43; illus. of various types, 1-26, 34, 42, 43, 44, 4-368, 369; ejector para., 6-75.
Jet Engine, 4-368; diagram, 4-370; alloys in engines 1-116; rocket, 6-421; jet-engined speed-boat, 1-501 illus.
Jet Propulsion, principle of, 4-368.
Jet Pump. Type of pump, 6-307 with diag.
Jetsam. See **Flotsam**.
Jetty. A pier or embankment used to direct or concentrate a current or to shelter a harbour.
Jevons, William Stanley (1835-82). Brit. political economist and logician; professor at Owens College, Manchester, and Univ. College, London.
Jewelry, 4-371; Mixtec, 1-334 illus.; platinum in, 6-222; silver alloys used in, 7-56; synthetic jewels,

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7-165, 166 illus. See also **Stones, Precious**.
Jewish Agency, The. A later development of the Zionist organization founded in 1897; aims and ideals, 4-302.
Jews. Semitic people, 4-373, history in Bible, 1-411; Palestine, 6-45; prophets, 6-295; Moses, 5-270; and Sargon II, 1-338; captivity under Nebuchadnezzar, 1-339; pass-over, 6-91; salt and sacrifices, 6-490; calendar, 2-171, 5-109; in Jerusalem, 4-361; money-lending, 1-363; musical instruments, 5-302; attitude to women, 5-135; numbers in New York, 6-416; persecutions, 6-170, 4-302, 6-211, 6-330.
Jew's Ear. An edible fungus (*Hirumula auricula-judae*) found on elder trees, named because it vaguely resembles a human ear in shape.
Jew's Harp. Small vibrating musical instrument. Consists of a metal loop terminating in two prongs and having along its length a strip of thin steel. The prongs are held in the mouth and the steel strip is vibrated by strokes of the player's fingers.
Jeynors. See **Jaipur**.
Jezebel. Idolatrous wife of Ahab, cursed by Elijah for treachery to Naboth (1 Kings xxi) and murdered by Jehu (2 Kings ix, 30-7).
Jezreel (Jēz'reel). Anc. city in plain of Jezreel, 50 m. N. of Jerusalem, cap. of Israel under Ahab; modern tn., Zerin, has a few ruins of Hittite interest.
Jhelum (Jh'elūm). Anc. Hydaspes, flows s.w. from Himalayas into Chenab r., in Pakistan (450 m.), 6-310, 4-259; and Vale of Kashmir, 4-393.
Jhelum. City in Punjab, Pakistan; burial place of Bucephalus, 2-102.
Jib Crane. Type of crane, 2-521.
Jibuti (Jibū'ti) or **Djibouti**, chief spt. and cap. of Fr. Somaliland; outlet for Abyssinian trade; rly. to Addis Ababa, 1-8; pop. 17,000; 7-84.
Jigger, Chigger, or Chigoe. Small tropical flea; causes irritation by burrowing under the skin.
Jiménez, Juan Ramón (b. 1881). Spanish poet, 7-122.
Jim'mu Ten'no or "Son of Heaven" (7th cent. B.C.). Legendary founder of the line of Jap. mikados, descendant of the sun-goddess and first ruler of Japan.
Jimson Weed or **Stinkweed**. Amer. name of the thorn-apple, highly poisonous plant of nightshade family.
Jinghis Khan. See **Jenghis Khan**.
Jingo (2nd and 3rd cent. A.D.). Legendary war like empress of Japan, of whose alleged conquest of Korea Japan based traditional claims of suzerainty over that country; name not connected with modern "Jingoes" a term for ultra-rabid British patriots derived from a song popular in 1878; "We don't want to fight, but by Jingo, if we do—"
Jinn. Supernatural being in Mahomedan belief.
Jinnah, Mahomed Ali (1876-1918). Founder of Pakistan and its first gov.-gen., 4-376, 6-40.
Jinrikisha. See **Rickshaw**.
Jiu, riv. of Rumania, rises in Transylvanian Alps and flows 200 m. to the Danube, 6-470.
Joachim (Yō'akēm), **Joseph** (1831-1907). Hungarian violinist and composer, called "the king of violinists" ("Hungarian Concerto"). His grand-nieces, Adila Pachiri and Jelly d'Aranyi, also attained fame as violinists.
Joad, Cyril E. M. (1891-1953). Brit. philosopher and broadcaster; reader in philosophy at Birkbeck Coll., Univ. of London; member of oxford B.B.C. Brains Trust.
Joan. Mythical woman pope supposed to have reigned about 855-858 as John VIII; the story says she fell in love with a Benedictine monk and fled with him to Athens disguised as a man, afterwards going to Rome and becoming a priest.

JOAN OF ARC

Joan of Arc (1412-31). The Maid of Orleans, 4-378; and Charles VII, 2-308; in Hundred Years' War, 4-204.

Joanna [Joan'a] (1479-1555). Queen of Castile, daughter of Ferdinand and Isabella, and mother of Emperor Charles V and Emperor Ferdinand I; did not actually rule, because partially insane.

Josiah or Jehoshaphat. King of Judah, about 837-797 B.C.; slain by conspiracy of his own servants (2 Kings xi, xii; 2 Chronicles xlii-xliv).

Josiah or Jehoshaphat. King of Israel, about 798-790 B.C.; expelled the Syrians from kingdom, defeated and captured Amaziah, king of Judah, and plundered the temple at Jerusalem (2 Kings xlii-xiv).

Job. Long-suffering character in the Book of Job, 4-377.

Jobber. Professional dealer on the Stock Exchange, who buys and sells securities (but not with the general public, who must act through a broker).

"**Job's Comforters**," origin of phrase, 4-377.

Joasta. In Gk. myth., queen of Thebes and mother of Oedipus, 5-505.

Jockey. Rider in a horse-race; colours, 5-400 illus.

Jockey Club. Controlling body of flat horse-racing in England; founded 1750; 4-199.

Jodhpur. Former princely state of India, absorbed in the Union of Rajasthan, 4-239.

Jodl [yö'dl], **Alfred** (1890-1946). Ger. soldier; Hitler's personal adviser on strategy during Second World War; signed Ger. surrender May 1945; found guilty at Nuremberg trials of conspiracy to wage aggressive war and executed.

Joel (5th cent. B.C.). Hebrew minor prophet, author of the Book of Joel, the 20th book of the Old Testament; prophesied the judgments coming to Israel and urged the people to repent and reform.

Joffre, **Joseph Jacques Césaire** (1852-1931). Fr. soldier and mathematician. During First World War was generalissimo of Fr. forces (1914-16). His inability to cope with modern warfare led to his resignation in 1916; 7-478.

Jogjakarta. Tn. in Java, Indonesia; pop. 1,100,000; 4-353.

Johannesburg. Tn. in Transvaal, S. Africa; pop. 880,014; 4-377, 7-88, 94 illus.; gold discoveries, 1-52, 4-30.

John. St. Apostle, son of Zebedee and brother of James, 1-184.

John, **Epistles of**. 23rd, 21st, and 25th books of New Testament, attributed to Apostle John; first exhorts to Christian faith; second and third are short notes, one to a church, the other to Gaius, a member of church; authorship disputed.

John, **Gospel of**. 4th book of New Testament, attributed to Apostle John; purpose to present life and works of Jesus so as to arouse faith in readers; authorship disputed.

John, **St.** (the Baptist), 1-0; and Jesus Christ, 4-364; Salome and his death, 4-170.

John, **pope**. For list see **Pope**.

John XXIII (c. 1370-1119). Anti-pope during the Great Schism; called Council of Constance by which he was deposed (1415); imprisoned in Germany.

John (1296-1346). Blind king of Bohemia; death at Crécy, 1-503, 2-527.

John (b. 1167; reigned 1199-1216). King of Eng., 4-373; plots against Richard I, 6-399; and Magna Carta, 5-80, 3-277 with illus. f.

John (1319-61). King of France, called "the Good," succeeded 1350; at Poitiers, 4-204.

John III, King of Poland. See **Sobieski**.

John.

John I (1357-1433). King of Portugal, called "the Great" and "father of his country," chosen king in 1385; father of Henry the Navigator.

John II (1455-95), "the Perfect," King of Portugal; under him Portugal reached height of its power.

John VI (1769-1826). King of Portugal; succeeded 1816 (regent from 1789); accepted Port. constitution after insurrection (1821) and recognized independence of Brazil (1825); exile in Brazil, 2-49, 6-269.

John, **Augustus** (b. 1878). Brit. painter of portraits and Gypsy scenes; influence of Goya shown in his etchings; 3-263; The Orange Jacket, 3-272 illus.

John, **Don**, of Austria (1545-78). Son of the Emperor Charles V and half-brother of Philip II of Spain, victor over Turks (1571) in famous naval battle of Lepanto.

John Barleycorn. Personification of malt liquor, 1-369.

John Biscoe, relief ship for Antarctic survey expeditions, 1-170.

John Bull. Name commonly used to personify the British people, 4-378, 5-434.

John Chrysostom, **St.** See **Chrysostom**.

John Dory. Predatory fish, coloured yellow (whence the name, from Fr. *jaune*, yellow—and *dore*, gilt), and with large dark spot on either side. Legend says that this is the mark of St. Peter's finger and thumb, the dory being the fish in whose mouth he found the piece of tribute money; a high, narrow body, large dorsal fins, front one with spiny rays.

John Gilpin. Cowper's ballad; origin of, 2-522.

John of Gaunt (1310-99). Duke of Lancaster; 4th son of Edward III of Eng., ancestor of House of Lancaster; character in Shakespeare's *Richard II*; birthplace at Ghent, 4-16; patron of Chaucer, 2-312; and Wycliffe, 7-505.

John of Groat's. Locality on N. coast of Scot., in Caithness; mistakenly regarded as the northernmost point of mainland of Gt. Brit.; named from an eight-sided house built by a Dutchman named Groat or Groot at end of 15th cent., 2-163, 166 illus., 2-85.

John of Leiden (c. 1510-36). Dutch religious (Anabaptist) fanatic and revolutionary leader; for a year ruled "the Kingdom of Zion" in Munster; executed by prince-bishop of Munster on capture of city.

John Rylands Library, Manchester, 5-112.

Johnson, **Amy** (1904-11). British air pilot, 4-379, 1-44.

Johnson, **Andrew** (1808-75). 17th pres. of U.S.A.; he succeeded Lincoln, holding office from 1865 to 1868; he was impeached in 1867, but acquitted.

Johnson, **Eather** (1680-1728). Jonathan Swift's friend "Stella," 7-205.

Johnson, **Samuel** (1709-84). Famous Brit. man of letters, 4-379; on Addison, 1-16; and Boswell, 2-22; dictionary and prose style, 3-288, 3-88; on Goldsmith, 4-12; and Lichfield, 4-191; on oats, 5-190; and Sheridan, 7-26.

Johnston, **Denis** (b. 1901). Irish dramatist, 4-287.

Johnston, **Sir Harry Hamilton** (1858-1927). Brit. administrator, African explorer; originator of plan for Brit. "Cape-to-Cairo" route; discoverer of okapi and other African animals; author of books on Africa and of several novels.

Johnstone. Industrial tn. in Renfrewshire, Scot.; pop. 15,661; 6-388.

Johnstown, Pennsylvania, U.S.A. Iron and steel mfg. city 76 m. E. of Pittsburgh on Conemaugh r. in soft-coal dist.; pop. 63,232.

Johore [joh'wə]. Sultanate and sate of Federation of Malaya under Brit. protection; area 7,330 sq. m.; pop. 738,251; rubber principal product and export; scene of bitter fighting early 1942 during Japanese advance on Singapore; occupied by Japan 1942-45, 5-94.

Joint-stock Companies, in banking history, 1-363.

JORDANS

Joinville [zhwanvél], **Jean**, **Sire** de (1224-1317). Fr. historian of Louis IX and his first Crusade.

Joliet. See **Architectural Terms**.

Joliet, **Louis** (1615-1700). Fr. explorer; with Marquette sailed down Mississippi r. to mouth of r. Arkansas (1673), 1-136, 5-227, 4-339.

Joliot-Curie [zholyö' küré], **Frédéric** (b. 1900). Fr. physicist; married Irene Curie (1896-1956), daughter of Pierre and Marie Curie; they engaged in research on radio-activity, turning aluminium to an isotope of phosphorus by alpha particle bombardment; awarded Nobel Prize for physics in 1935; 3-12.

Jo'nah. Hebrew prophet (? 8th cent. B.C.); as told in Book of Jonah, disobedient to divine summons, draws storm on ship in which he tries to escape; is thrown into sea and swallowed by a great fish; is saved by Jehovah; delivers divine message to Nineveh, but resents city's preservation until taught compassion by lesson of the gourd.

Jonathan. Son of Saul, king of Israel, friend of David. Died in battle against the Philistines, 4-371, 3-54.

Jones, **Grimith** (1693-1761). Welsh divine; he was a pioneer in Welsh education, both religious and secular; he set up many "circulating charity schools" with great success.

Jones, **Sir Harold Spencer** (b. 1890). Brit. astronomer; Astronomer Royal 1933-55; measured more accurately the distance from the earth to the sun, wrote *Life on Other Worlds*, etc.

Jones, **Henry Arthur** (1851-1929). Brit. dramatist; among his chief plays are *The Silver King*, which brought him into prominence, *Mrs. Dan's Defence*, *The Lyons*, 3-291.

Jones, **Inigo** (1573-1633). Eng. architect, introduced Palladian style of architecture, 4-381, 1-212.

Jones, **John Paul** (1717-92). Amer. naval hero, 4-381, 1-139.

Jones, **Sir Robert** (1858-1933). Brit. orthopaedic surgeon, 5-165.

Jones, **Robert Tyre** (Bobby) (b. 1902). Amer. golfer; frequent winner of championships in both U.S.A. and England (British open, 1926, 1927), 4-41.

Jones, **Sir William** (1716-91). Brit. Orientalist and linguist; first Eng. work on Sanskrit, leading to foundation of Indo-European philology, 6-158.

Jongkind [jong'kint], **Johann Barthold** (1819-1891). Dutch painter; born Lattrop, Holland; forerunner of the Impressionists and distinguished as an etcher.

Jongleurs. Medieval musicians and jugglers, 2-101.

Jonker Diamond. See **Jacobus Jonker**.

Jönköping. Tn. in Sweden at s. end of Lake Vätter. Mfrs. matches, machinery, wood pulp, paper, textiles; pop. 12,000.

Jonquill. Bulbous rooted perennial plant, *Narcissus jonquilla*. Height up to 18 in. Leaves long, narrow. Flowers yellow, in small clusters.

Jonson, **Ben** (c. 1573-1637). Elizabethan dramatist, 4-382, 3-285; first poet laureate, 6-232.

Jooss [jyös], **Kurt** (b. 1901). Ger. choreographer and ballet master; his co., the Ballet Jooss, appeared in London, Paris, New York; created *The Green Table*, *Panorama*.

Joppa. See **Tel Aviv-Jaffa**.

Jordans, **Jakob** (1593-1676). Flemish painter, 5-382.

Jordan. The Hashemite kingdom of the Jordan; area 34,750 sq. m.; pop. 1,257,000; cap. Amman, 4-382; flag, 3-385 illus. f.; war with Israel, 4-303; old city of Jerusalem 4-361.

Jordan. r. of Palestine; rises in N. flows 200 m. s. in deep valley through lakes Merom and Galilee to Dead Sea, 4-383; in Bible story, 6-48, 6-45 illus.

Jordan Almond, 1-118.

Jordans. Vill. of Bucks, Eng., famous for its Quaker associations; burial place of Wm. Penn, 2-103, 6-118.

JOSEPH

Joseph. Hebrew patriarch, son of Jacob and Rachel, 4-383, 4-373.
Joseph, St. Husband of Mary, the mother of Jesus (Matt. I, II; Luke II).
Joseph I (1678-1711). Holy Roman emperor, succeeded to throne 1705; vigorously prosecuted wars against France and Hungary, and forced pope to acknowledge his brother Charles as king of Spain; a liberal ruler, especially in religion and matters relating to peasantry.
Joseph II (1741-90). Holy Roman emperor, son of Maria Theresa; benevolent despot; upset old customs and provoked discontent and revolt; died disillusioned and broken-hearted; 5-123.
Joseph, Father (1577-1638). French Capuchin friar, Richelieu's secretary and confidential adviser, nicknamed, because of his influence, the "Grey Eminence" ("Eminence Grise").
Joseph (Bonaparte). King of Naples and Spain. See Bonaparte, Joseph.
Joseph Andrews. Novel by Henry Fielding, 5-471.
Josephine, Marie Rose, Empress of the French (1763-1814). First wife of Napoleon I, 4-383.
Josephine de Malines. Variety of pear, 6-100.
Joseph of Arimathea's. Rich Israelite, who entombed the body of Jesus; said to have brought the Holy Grail to Britain; 4-54.
Josephus, Flavius (c. A.D. 37 - c. 95). Jewish historian (*The Jewish War*, 170 B.C.-A.D. 70; *Antiquities of the Jews* from earliest time to reign of Nero); use of Gk. language, 4-151.
Joshua. Sixth book of Old Testament, named after Joshua; account of Jewish settlement in Canaan, 4-374.
Jostedalreen, Norway. Largest glacier in Europe, 580 sq. m., 5-462.
Jotunheim Mts. Norway, 5-162, Thor's visit to, 7-270.
Joubert, Petrus Jacobus (1831-1900). Boer soldier, commandant-general in first and second Boer wars; repelled Jamison Raid.
Joule, James Prescott (1818-89). Brit. physicist; measured mechanical equivalent of heat (Joule's Law), 4-384, 3-215, 4-146.
Joule (J). The M.K.S. unit of work or energy. It is the work done by one newton (q.v.) acting through a distance of one metre; or, the work done in one second by a current of one ampere flowing through a resistance of one ohm. Named after J. P. Joule, 4-385; Joule's Law, 4-384.
Journalism, as a career, 2-236.
Joust. Knightly combat in which the contestants fought singly; Henry VIII tilting, 4-417 illus.
Jove. See Jupiter; Zeus.
Jowett [jə'wɛt], Benjamin (1817-93). Brit. scholar, theologian, and great teacher, master of Balliol College, Oxford; translations of Plato, 6-223.
Joyce, James (1882-1941). Irish author; remarkable for psychological analysis of character, realistic handling of themes, and a style verging sometimes on incoherence. Wrote *Dubliners* (1914); *Ulysses* (1922); *Finnegans Wake* (1939); influence on the novel, 5-473, 4-287, 3-291.
Joyce, William ("Lord Haw-Haw") (1906-46). Nazi radio propagandist, an Irishman of American birth; went to Germany from U.K. Aug. 1939; broadcast in English to the U.K. throughout 2nd World War; naturalised a Ger. Sept. 1940; was hanged as traitor to U.K. 1946.
Joynton-Hicks, Sir William. See Brentford, Viscount.
Joystick. Popular name for control column used in aeroplanes, 1-39, 40.
Juan [hwa'n] or **Giovanni** [jə'vahn'i]. Don. Profligate hero of Sp. legend; subject of many works of art, including Mozart's opera, *Don Giovanni* and Byron's poem, *Don Juan*.
Juan de Bourbon, Don (b. 1913). Son of Alfonso XIII of Spain; proclaimed king by his father, 1-102.

JUNKERS

Juan Fernandez Island, 400 m. w. of Valparaiso, Chile; Alexander Selkirk (Robinson Crusoe) and, 3-2, 2-359.
Juarez [hooah'reth], Benito Pablo (1806-72). Mex. statesman, sometimes called the "Mexican Washington," 5-188.
Ju'bal. Hebrew inventor of musical instruments (Gen. IV, 21).
Ju'baland. Region in E. Africa, adjoining the r. Juba; formerly a part of Brit. Kenya Colony, it was ceded to Italy in 1924, and became part of It. Somaliland.
Jubbulpore, India. Mfg. and trading city in Madhya Pradesh; pop. 178,300; cotton; military centre.
Jubilee. A special anniversary, especially in the R.C. Church, former term for a Holy Year (q.v.); notable Brit. jubilees have been Queen Victoria's (Golden) Jubilee (1887), 50th anniversary of accession; Victoria's Diamond Jubilee (1897), 60th anniversary; and King George V's Silver Jubilee (1935), which marked the completion of 25 years on the throne; Queen Victoria's, 7-396.
Judah [jə'da], Hebrew patriarch, 11th son of Jacob and Leah, traditional ancestor of tribe of Judah.
Judah. The southern kingdom of the land of the Hebrews, after the division into the two kingdoms of Israel and Judah, (10th cent. B.C.), 4-371.
Judaism, religion of the Jews. See Jews.
Judas Iscariot. One of the 12 disciples, 1-184; betrayal of Jesus, 4-367.
Judas Macabaeus. See Macabees.
Judas tree. The traditional tree on which Judas Iscariot hanged himself; the species in question, *Cereus siliquastrum*, of the pea tribe, is found in southern Europe.
Jude, St. Apostle, 1-184.
Jude, Epistle of. Twenty-sixth book of New Testament, doubtful authorship, often attributed to Jude, brother of Jesus, described as "brother of James" (Jude I, 1); exhortation to constancy in Christian faith.
Judge. One who presides in a court of law; symbolism of ermine robes, 3-296; in various courts of justice, 2-521; removal from office, 2-522.
Judge Advocate-General. Minister of the Crown whose duty it is to advise in questions of military law, especially courts-martial.
Judges, Book of. Seventh book of the Old Testament; history of Israelites under the rule of the Judges.
Judicial Committee of Privy Council. The final court of appeal in the British Commonwealth, being composed of a committee of members of the Privy Council, represented by the lord chancellor, previous lord chancellors, and others who hold or have held high judicial offices; any matter under dispute affecting certain countries of the Commonwealth (apart from Great Britain whose cases go to the House of Lords) comes before this committee, which makes a recommendation to the Sovereign.
Ju'dith. Jewish heroine, captivated Assyrian general Holofernes and slew him while he slept, thereby delivering the besieged Israelites; story told in the ap. apocryphal book of Judith.
Judith. Abyssinian queen (1876-1930), 1-7.
Judo. See Jujitsu.
Judy. Wife of Punch in Punch and Judy puppet show, 6-308.
Juggernaut. Eighth embodiment of Ind. god Vishnu, "Lord of the World." At annual pilgrimage to Puri (formerly Jagannath), Orissa, his idol is drawn on an enormous car, under the wheels of which, it is said, devotees used to throw themselves, 4-240 illus. t. Word is often used for any huge vehicle, or for great force crushing all opposition.
Jugoslavians. See Yugoslavians.
Jugurtha (d. 104 B.C.). Usurping king of Numidia; defied Rom. power for several years, defeating or bribing opposing generals.
Jujitsu. Japanese art of self-defence, 4-355.
Julia. Niece of Rom. emp. Augustus; and dwarfs, 3-110.
Julian (Flavius Claudius Julianus) (A.D. 331-363). Rom. emperor, called "the Apostate"; nephew of Constantine the Great; brought up as Christian, became philosophic pagan; emp. A.D. 361; last pagan emperor.
Juliana [yoollah'nal]. Queen of the Netherlands and Princess of Lippe-Biesterfeld (b. 1909). Only child of Queen Wilhelmina, and succeeded to throne on her abdication, Sept. 1, 1948, 5-378 illus. Married Prince Bernhard Leopold of Lippe-Biesterfeld (b. 1911), Jan. 7, 1937. Four daughters, Beatrix, born Jan. 31, 1938; Irene, born Aug. 5, 1939; Margriet, born Jan. 19, 1943; Maria Christina, born Feb. 18, 1947.
Juliana Canal, Netherlands. Artificial waterway 22 m. long, built 1933, it connects Maastricht with Maastricht.
Julian Calendar. Julius Caesar's reform of calendar, 2-171.
Julia Proclia. Mother of Agricola, 1-69.
Julius I, St. (d. 352). Pope. Festival, April 12.
Julius II (1443-1513). Pope, 1503-1513, patron of art, started re-building of St. Peter's; and Borias, 2-17; and Louis XII, 4-311.
Julius Caesar. Tragedy by Shakespeare, 5-120.
July. 7th month of the year; origin of name, 5-255.
Jun'bo. Name of largest captive elephant known (11 ft. 2 in. at death, then still growing); at London Zoo for many years, sold to P. T. Barnum in 1882, accidentally killed 1885, 3-226.
Jun'na. Tributary of the r. Ganges, N. India; rises in Himalayas, flows 860 m. s. and S.E. to Ganges r.; Ganges irrigation system, 3-501.
Jumping. In athletics; types, standard performances, 1-290, 292, 291 illus.
Jumping Bean. Name for large seed of several rosinous trees and plants native to Cent. and S. Amer. The seeds are often infested with larvae of a small grey moth; movements of larva during transformation into a pupa cause the seed to roll about, occasionally to jump. Also known as Mexican bean and broncho bean.
Junagadh. Former princely state, now in Republic of India, 4-255.
Juncoaceae [junka'see]. Plant family incl. juncos.
June. 6th month of the year; origin of name, 5-255.
Juneau, Alaska. Cap. and largest city; on inlet of Pacific 100 m. N. of Sitka; pop. 5,818; commerce in gold, furs; 1-90, 89 illus.
Jung, Carl Gustav (b. 1875). Swiss psychologist, 4-386, 5-163; portrait, 6-300 illus.
Jungfrau. Mt. of Bernese Oberland, Switz., over 13,000 ft. high, 1-126, 124, 125 illus.
Jungle. Type of tropical forest, 3-421; Amazon, 1-129 illus.
Junior Counsel. Barrister, 4-459 illus.
Junior Technician, in R.A.F.; insignia, 6-187 illus.
Junior and Senior Training Corps. Corps attached to schools, etc., for military training, 2-158.
Juniper. Conifer tree or shrub, 4-386, 2-484; poisonous berries, 6-236.
Junipero Serra, Miguel José (1713-84). Span. missionary. Franciscan friar; Californian explorations, 2-177.
Ju'nias. Pen-name of author of a famous series of scathing Eng. political letters attacking George III and his ministers (1769-72); real authorship never proved, attributed to more than 40 persons, but generally conceded to Sir Philip Francis.
Junk. Oriental boat (usually Chinese or Japanese), 1-498 illus., 7-512.
Junkers [yoon'kex], Hugo (1859-1935). Ger. aircraft designer; in

JUNKERS




1919 founded Junkers works at Dessau which produced bombers (Ju. 87, Ju. 88, etc.), and transports (Ju. 52) of the 2nd World War; 2-78.
Junkers. Class of Prussian landed gentry, standing for militarism and reaction; and Bismarck, 4-474.
Juno. In Rom. myth., chief goddess and wife of Jupiter; identified with Gk. goddess Hera, 4-386 7-522, 523 illus.; and Trojan War, 7-320.
Juno. Minor planet, between Mars and Jupiter, 4-386.
Junot, Marshal Androche (1771-1813), Fr. soldier; at battle of Vimetro in Peninsular War, 6-116.
Jupiter. Planet, 6-213, 4-386, 387 illus., 7-522 523 and illus.; in solar system, 1-278 diag., 1-282, 7-183 illus.; atmosphere of, 1-82; satellites discovered by Galileo, 1-281.
Jupiter. In Rom. myth., chief of the gods, identified with the Gk. Zeus, 4-386 7 522 523 with illus.
"Jupiter" Symphony, by Mozart, 5-280.
Jura [joo'ra] ("deer island"), 4th largest of Inner Hebrides, 160 sq. m., 4-152.

Jura Mountains. On border of Fr. and Switzerland, 4-386, 7-211; asphalt mines (Val de Travers), 1-275, 4-387.
Jurassic Limestones, in Britain, 4-510.
Jurassic Period. In geology, 5-515, 516.
Jurua, r., tributary of the Amazon, 1-129.
Jury, 4-387, 2-521, 4-53; in Athens, 1-288; Henry II's reforms of the jury system, 4-162.
Jus Gentium. "Law of nations," the beginning of international law.
Justice, Courts of. See Courts of Justice.
Justice of the Peace (J.P.). Local magistrate; duties and powers, 2-521.
Justin I (450-527). Byzantine emperor; an ignorant peasant, he rose to power through army.
Justinian I (483-565). Emperor of the E. Rom. Empire. Succeeded Justin as emp. in 527. With his generals Belisarius and Narses reconquered N. Africa and Italy from the Vandals and Ostrogoths. His greatest work was his codification of Rom. law; 2-148, 5-199; Code of, 2-149, 4-457; mosaic portrait at Ravenna, 4-317.

KAMET

Justin, Martyr, St. (c. 160-165). An early Church Father; one of foremost Christian apologists; b. in Palestine of pagan parents; said to have been beheaded at Rome.
Just So Stories, by Rudyard Kipling, 4-412.
Jute. Vegetable fibre, 4-389, 6-44 illus.
Jutes. A Teutonic people who invaded Britain in 5th cent.; generally believed to have come from Jutland, 2-75, 3-276.
Jutland. Low flat peninsula of N.W. Europe, forming largest part of Denmark.
Jutland, Battle of (1916), 4-390, 3-72 with map, 7-481, Jellco at, 4-359
Juvenal (60-140) (Decimus Junius Juvenalis). Rom. poet and satirist, whose writings express a burning hatred of the evils of his time, 4-451.
Juvenile Courts. Special courts in which child offenders are dealt with; in former times children were tried just like older criminals, and sent to prison, but now they are usually sent to a special institution or approved school, 6-291.

K

OUR letter K was once the Egyptian hieroglyph  which was the picture of a bowl. But when written, it looked like this  and its modified form  in the Phoenician alphabet began to look somewhat like our K, written backwards. The Phoenicians called it *kaph*, which means "the palm of the hand," or perhaps "the bent hand." The Greeks gave it its present form, changing the name to *kuppa*. In Latin, C came to be used

for *k* sound, K being used only in certain abbreviations this influenced use of C for *k* sound in Anglo Saxon and Early English, e.g. *cyning* (*king*). The practice of giving the *s* or *sh* sound before certain vowels (as in *century*, *cinder*, *ocean*) led to confusion. Then K came to be used particularly before *e* and *i*, for the hard sound, as in *kin*, *keg*, etc. The combination *ck* was originally *kl*, this being used after a short vowel when *ed*, *er*, or *ing* was added

K2 (mt.). See Godwin-Austen.
Ka'aba Shrine, Mecca; contains the famous sacred Black Stone; Mahomedan pilgrims at, 5-156, 155 illus.
Kabul [kahl'ool]. Afghanistan cap. and largest city, key to N. India; pop. 80,000; in fruit dist.; 1-46, 47 illus.
Kabyles. Berber people of Algeria; village in Atlas Mts. 1-110 illus.
Kachins. A marauding people of Indo-Chinese origin, living along border of Upper Burma; Kachin state within Union of Burma formed 1948
Kaduna. Tn. and railway junction in Nigeria, 5-436.
Kaffa (Climex). See Feodosia.
Kaffir Corn. A variety of sorghum, often misnamed millet; native to India and South Africa and widely cultivated
Kaffirs. Bantu-speaking negroid peoples of S. Africa, 1-51; and early settlers, 7-90.
Kafka, Franz (1883-1924). Austrian novelist; *The Verdict*; *The Great Wall of China*; *The Castle*; *The Trial*, *America* (published posthumously).
Kagoshima [kagoshé'ma]. Japan. One of the chief cities of Kyushu Isl.; pop. 181,700; home of the famous crackle Satsuma ware.
Kahikatea. Timber tree of the yew family, grown in New Zealand valued for its tough wood, 5-422.
Kahoolawe. One of the Hawaiian Is., area 45 sq. m., uninhabited, 4-139.
Kaleteur Falls. In British Guiana, on the Potaro r. The falls are 300 ft. wide, with a sheer drop of 740 ft.
Kailfengtu [kifeng'too] or Kailfong, China. Walled city, cap. of prov. of Honan, 450 m. s. of Peking; pop. 200,000.
Kalirani (people). See Maldao.
Kal Kawun. Legendary Persian king who tried to fly by harnessing eagles to a carriage; flying carriage, 1-28 illus.

Kailas. Mt. in Himalayas, source of the Indus r., 4-259.
Kalinite. Mineral consisting of potassium chloride and magnesium sulphate. One of the sources of potassium; used as a fertilizer.
Kalirwan [kair'wan]. 2 Tunis. Sacred city of the Mahomedans; contains beautiful Ukkah mosque, rebuilt in 827; one of the most holy places of Islam; pop. 32,280; 7-321.
Kalzar-i-Hind [kizazehind]. Medal. Awarded for public services rendered to the former Indian Empire, given to any race and either sex—had three classes—1st, gold; 2nd, silver, 3rd, bronze, instituted by Queen Victoria in 1900.
Kaisariyeh [kizazé'a] or Kayseri, Turkey. Trade centre in Asia Minor 160 m. s.e. of Ankara, pop. (1945) 57,700; exports carpets, hides fruit; anc. Caesarea.
Kaiser-Friedrich Museum, Berlin, Ger. 5-301.
Kaiserslautern [kizerzlow'tern], Ger. many. Industrial city in Bavaria 35 m. w. of Mannheim, pop. 62,600, Frederick Barbarossa built castle here about 1152.
Kaiser Wilhelm Canal. See Kiel Canal.
Kaiser Wilhelm's Land or German New Guinea. Territory now administered by Australia under U.N. trusteeship See New Guinea.
Kala-azar or Black Fever. Tropical disease; sandy transmits, 5-402.
Kalah or Calah. Anc. Assyrian city, built 1300 B.C. by Salmanser I; abandoned, then rebuilt about 880 B.C.; excavations revealed much monumental material, 5-442.
Kalahari Desert. S.W. Africa; area about 200,000 sq. m.; 1-49.
Kalat [kalah't] or Kelat. Cap. of native state of Kalat in Baluchistan; pop. of state, 253,300; town, 18,000; trade centre, rapid growth since 1900; 1-368.
Kale. Vegetable, 2-151.

Kaleidoscope, 4-391; Brewster and 2-56
Kalevala [kahlé'vah'la]. Anc. Finnish epic; Longfellow closely imitated its rhythm and spirit in *Hiawatha*
Kalgoorlie. Tn. in W. Australia famous for the rich East Coolbidge gold mines, pop. 12,900; 7-442
Kali [kahlé]. In Hindu myth. the Black Goddess of murder, death and plague, patroness of thieves, wife of Siva.
Kalidasa [kahlédah'sa] (fl. 500-550). Greatest dramatic and lyric poet in India (*Sakuntala*).
Kalinin, Michael Ivanovich (1879-1946). Rus. politician, banished 1908; active in 1917 Revolution first pres. dent of Petrograd (Leningrad) Soviet 1923; pres. of the Presidium of the Supreme Soviet until then pre-ident of U.S.S.R. 1938-46
Kalinin, formerly Tver, Soviet Russia Cotton mfg., and trade centre of Volga; pop. 216,000.
Kalininograd. Former cap. of E. Russia then called Königsberg, but renamed when annexed by Russians, 6-211
Kalmar or Calmar, Sweden. Port and cathedral tn. 200 m. s. of Stockholm pop. 24,400; Union of Calmar (1397-74, 5-465).
Kalmucks. Mongol people, 5-239
Kalmuck Steppes, s. Russia. Large arid plains inhabited by nomadic Tartars engaged in livestock raising
Kama [kah'ma]. In E. Russia, large tributary of Volga; over 1,000 mi. long
Kamran. Island in Red Sea, part of Aden colony, 1-19.
Kamohaka. Peninsula, in E. Siberia annexed by Russia in 1706; area 105,000 sq. m.; pop. under 10,000
Fishing, hunting and fur-trapping Kamran. Former German colony See Cameroons.
Kamet. Highest peak of the central Himalayas (26,447 ft.); ascended by F. S. Smythe expedition 1931

KAMIKAZE

Kamikaze. Corps of Jap. suicide fighter pilots who crashed their planes loaded with explosives on aircraft-carriers, destroyers, etc., of the Allied Pacific fleets; active in Philippines sea battle, Oct. 1944, and off Okinawa, May-June 1945.

Kampala. Tn. and commercial centre of Uganda; pop. 7,400. 7-343.

Kampen. Netherlands. Tn. near mouth of r. Yssel; pop. 24,387; Hanseatic tn.; 14th cent. tn. hall.

Kampung. Village compound in Malaya.

Kanaka. Malayan and Polynesian for "man." Indicates ordinary labourer, boatman, servant etc.

Kanawha. [kahnah'wa] or **Great Kanawha.** Large r. of W. Virginia, U.S.A., flowing N.W. to Ohio r.; 100 m. long; the Little Kanawha is 100 m. long.

Kanazawa. [kahnahzah'wah]. City on W. coast of main Isl. of Japan; pop. 183,000; bronze and lacquer work, pottery, silk; fine gardens; heavy earthquake damage, June 28, 1918.

Kanchenjunga. Mt. See **Kinohinjunga.**

Kandahar. [kandahahr']. Cap. of prov. of same name and trade centre in Afghanistan; pop. 77,000; captured by Jenghiz Khan, Tamerlane, and others; prominent in wars between Brit. and Afghans; Robert's relief of, 6-414, 1-47.

Kandy. [kau'di]. Ceylon. Highland tn. in centre of Isl. on artificial lake; pop. 52,000; cap. of former native kingdom of Kandy; annexed by Britain in 1815; Buddhist temple, 2-298.

Kangaroo. A marsupial (pouched) mammal occurring only in Australia, New Guinea, and neighbouring isls. 4-391, 1-316 illus.; foot, 3-413 illus.; legs, 5-100.

Kano. City in Nigeria; pop. 130,000; dyeing pits, 5-136, 435 illus.

Kano Monotoku. (1176-1539). Jap. artist, founder of Kano school of Jap. art, 4-353.

Kanpur. See **Cawnpore.**

Kansas. State of U.S.A.; area 82,276 sq. m.; pop. 1,905,299 cap. Topeka, 4-392.

Kansas City. Kansas, U.S.A., largest city in state at junction of Kansas and Missouri rivs.; pop. 129,553, slaughtering and meat-packing centre; 4-392, 5-227.

Kansas City. Missouri, U.S.A., 2nd city of state, on Missouri r.; pop. 153,290; 5-227.

Kan-su. North-westernmost prov. of China; 115,000 sq. m.; pop. 6,705,000; cap. Lanchow; dyes, gold mercury, silks, musk, tobacco.

Kant. Immanuel (1724-1804). Ger. philosopher, 4-393, 6-160.

Kantara. Eg. tn. on Suez Canal; rly crosses on swing bridge.

Kaolin. A very fine clay used in porcelain, 6-277.

Kapit'za, Peter (b. 1894). Russ. physicist; asst. director in magnetism, 1924-32, at Cavendish Lab., Cambridge, and director Royal Soc. Mond Lab., 1930-35, where he researched on atomic physics; in 1935 visited Russ., was held there, and made director of the Inst. for Physical Problems, Acad. of Sciences of U.S.S.R.

Kapok. Fibre from pods of a tropical tree, 4-393.

Kappa. κ K (Rom. k. K). Tenth letter of Gk. alphabet.

Karachi. Cap. of Pakistan, pop. 1,126,417 4-393, 6-259, 6-14, 43 illus.

Kara-George ("Black George") (c. 1782-1817). Nickname given by Turks to George Petrovitch or George Czerny, Serbian peasant, leader of 1st Serbian war of independence (1804-08) and founder of Karageorgovitch dynasty, 6-532.

Karadjich [karah'yich], **Vuk Stefanovich** (1787-1866). Father of modern Serbian literature; bent efforts toward adoption of vernacular Serbian

as literary language; wrote Serbian grammar and dictionary.

Kara-Kalpak. Autonomous S.S.R. in Uzbekistan.

Kara Kirghiz. Mongolian race living in highlands of cent. Asia on Pamir plateau, 1-264.

Karakoram. [karakō'ram] or **Mus-tagh Mts.** Range of cent. Asia N.W. end of Himalayas; highest peak, Mt. Godwin-Austen (28,278 ft.) is 2nd highest mt. in world; 4-170, 4-239.

Karakul sheep. fleece from, 7-22, 7-95 illus.; in S.W. Africa, 7-89.

Kara Kum Desert. U.S.S.R., E. of Caspian Sea; area 135,000 sq. m. Proposed to divert Amu Daria r. to Caspian and thus irrigate part of desert; 8-78; settlement in, 6-479.

Kara (kah'ra) Sea. Arm of Arctic Ocean between Novaya Zembla and N.W. coast of Siberia. Kara Strait is at W. entrance.

Karelo-Finnish S.S.R. Area 69,720 sq. m.; pop. 606,000; cap. Petrozavodsk, 6-477. Note: Since Vol. VI was printed this republic has been absorbed into R.S.F.S.R., July 16, 1956, as Karelian A.S.S.R.

Karens. A people of Siamese-Chinese origin, numbering about 1,000,000, who live in the hill regions of central Burma; Karen state within Union of Burma formed 1954, 2-130; Karen girl, 2-131 illus.

Karikai [karik'ka]. Former Fr. settlement in S.E. India; 53 sq. m.; 4-210.

Karil. Buddhist chapel between Bombay and Poona, India; monastery cave temple at, 2-281 4-216 illus.

Karl Marxstadt. Name given to Chemnitz, Saxony in May 1953.

Karlovy Vary. See **Karlsbad.**

Karlsbad, Carlsbad, or Karlovy Vary. Czechoslovakia. Famous watering-place, 78 m. W. of Prague; pop. 53,763; Karlsbad decrees issued here (1819) put univs. and press under strict censorship to suppress liberal agitation.

Karlakrona or **Carlskrona**, Sweden. Port on Baltic, 238 m. S.W. of Stockholm; pop. 32,300; Swedish naval headquarters, fine deep harbour, arsenal, shipyards; exports fish, stone, iron, lumber.

Karlsruhe [kahrlz'roor] or **Carlsruhe**, City in *Land* of Baden Württemberg W. Ger. Industries include heavy and light engineering, pottery, chemicals, brewing. Pop. 172,340.

Karma. Doctrine in Hinduism and Buddhism, connected with reincarnation. The belief is that in (re)incarnated after life one pays for one's sins and errors in this life, or reaps the reward of one's endeavours.

Karnak [kah'n'ak]. VII. on Nile in Upper Eg. on N. part of site of anc. Thebes; remains of Temple of Ammon, greatest of all known temples; 3-186 illus., 3-196 illus., 197, 3-173, 1-209 illus.

Karnatak (India). See **Carnatic.**

Karno, Fred (1866-1941). Brit. comedian, born Frederick John Westcott; Karno shows and Chaplin, 2-303.

Karolyi [kah'ryōi], **Count Michae.** (b. 1875). Provisional pres. of the Hungarian People's Republic (Nov. 1918-March 1919), handed reins to Soviet gov't because of stern Allied terms, banished 1919-46. Hungarian min. in Paris, 1947-49, 4-207.

Karons. Pygmy people of N.W. New Guinea, 6-312.

Karoo. Tablelands in S. Africa, 7-88.

Karrer, Paul (b. 1889). Swiss chemist; for research on vitamins A and B received Nobel prize 1937; wrote textbook on organic chemistry.

Kars. Tn. of Armenia about 100 m. S.E. of Batum; pop. 25,000; Mahomedan holy city, with 11th cent. "Cathedral of the 12 Apostles"; cap. of a medieval Armenian principality; several times besieged in wars between Russians and Turks.

KAZAKHSTAN

Karsavina [karsah'vina], **Tamara** (b. 1883). Russ. dancer, leading member of Diaghilev company; notable rôles included *The Fire Bird* and *Scherchenade*, 1-352.

Karshi [kah'shi]. Commercial centre of Bokhara, Uzbek S.S.R. 96 m. S.E. of city of Bokhara; pop. 14,000.

Karst. Limestone region of Yugoslavia where removal of forests and consequent washing away of surface soil has exposed bare limestone and led to formation of swallow holes; the name is applied to similar regions in other countries.

Kasai River. River of Africa, tributary of the Congo; rises in N.E. Angola and flows N.W. for 1,000 m. to Congo; 2-480, 181 map.

Kasbek, Mt. See **Kazbek, Mt.**

Kashgar [kashgahr']. Commercial centre of Sinkiang China; pop. 80,000; 1-266.

Kashmir. Mountainous state in far north of India; area 81,500 sq. m.; pop. 4,000,000; 4-393; dispute between India and Pakistan, 6-12, 4-255; carpets, 2-219.

Kashmiri. People of Kashmir, India, 4-391.

Kassel or **Cassel.** City of W. Ger. in the *Land* of Hessen; pop. 127,568; important industries made it target for heavy air attack during 2nd World War; lower town flooded by breaching of Eder dam in 1913.

Kassites. Elamite tribe overran Babylon 18th cent. B.C.; founded dynasty.

Kästner [kestner], **Erich** (1899-1912). Ger. writer; his children's book, *Emil and the Detectives*, translated into many languages and filmed.

Kast'ro. Formerly Rhodes, cap. of Isl. of Rhodes; founded 408 B.C.; walls and old stone houses preserve medieval appearance; trade centre.

Kastro, Isl. See **Mytilene.**

Katahdin. Mt. in Maine, U.S.A., (3,268 ft.), 5-90.

Katanga. Prov. of the Belg. Congo, a great copper-mining area; rail connection with the Cape and W. Africa.

Katowice [kah'tōv'ice]. Tn. of Silesia, Poland; centre of industrial district; pop. 141,277; 6-238. Renamed Stalinogrod, 1953.

Katrine, Loch. L. of Perthshire, Scot. 5 sq. m.; noted beauty spot of Trossachs, 6-138, 6-510, 511.

Kattegat or **Cattegat.** Strait between Denmark and Sweden; 130 m. long, greatest width 90 m.; 1-357, 3-72, 5-462; map, 5-463.

Katzbach River. Tributary of Oder in Silesia, now Polish, on its banks Prussians under Blücher defeated French under MacDonald (1813).

Kauai [kow'i]. One of the Hawaiian isls., area 555 sq. m.; pop. 29,683; sugar and pineapples; 4-139.

Kauffmann [kow'fmann], **Angelica** (1741-1807). Anglo-Swiss painter; foundation member 1768 of Royal Academy; skilful interior decoration of mansions designed by Adam brothers. Friend of Garrick, Reynolds and other famous men.

Kaunas. Tn. Lithuania S.S.R.; pop. 152,365, 4-524.

Kauri Gum. resin of, 4-107.

Kauri Pine. Coniferous tree native to New Zealand and Queensland, Australia; timber used in cabinet-making and shipbuilding, 5-422.

Kava [kah'va] or **Ava.** A shrub of the pepper family from which an intoxicating beverage is prepared in the Pacific isls.

Kavele. See **Ujiji.**

Kay, John (1704-c. 1764). Eng. inventor of the flying shuttle in weaving, 7-434, 4-259.

Kay, Sir. Legendary knight in Arthurian stories; son of Sir Hector, and step-brother to King Arthur, 1-256.

Kayak. Eskimo canoe, 1-501 illus.

Kayans. People of Borneo, 2-18, 19 illus.

Kayseri (Turkey). See **Kaisariyeh.**

Kazakhstan. State of U.S.S.R.; area 1,073,000 sq. m.; pop. 6,160,000; cap. Alma-Ata; 6-477.

KAZAN

Kazan [kazahn']. Mfg. and commercial centre in E. Russia, 430 m. E. of Moscow; pop. 401,000; cap. of anc. Tartar kingdom taken by Russians in 1552; university.

Kazbek or **Kasbek**, Mt., one of the highest peaks of Caucasus Mts., 90 m. S.E. of Mt. Elbrus, 16,500 ft., 2-274, 3-524.

Kazvin [kazvén']. Tn. in Persia, 92 m. N.W. of Teheran; pop. (1910) 60,000; trade in rice, fish, raisins, silk; remains of old walls and buildings shattered by earthquakes.

KDKA. Call letters of the first regular broadcasting sta. in world at E. Pittsburgh, U.S.A., 6-346.

Koa. Parrot-like bird found in New Zealand; attacks sheep, 6-92.

Kean, Edmund (1787-1833). Brit. Shakespearean tragedian, one of the foremost of all time; according to Coleridge, "seeing him act was like reading Shakespeare by flashes of lightning."

Kearton, Cherry (1871-1940). Brit. naturalist; produced several films of animal life; wrote *Wild Life across the World*, *My Animal Friendships*, *Adventures with Animals and Men*.

Kearton, Richard (1862-1928). Brit. naturalist, brother of the above, wrote *With Nature and a Camera*, *Wonders of Wild Nature*, *Our Bird Friends*.

Keats, John (1795-1821). Brit. poet, 4-394, 3-289, 5-437.

Kebble, John (1792-1866). Brit. clergyman and poet (*The Christian Year*); professor of poetry at Oxford for 10 years; Kebble College, Oxford, built as a memorial to him; 4-226.

Kebble College, Oxford Univ., 6-18.

Kebnekaise [cheb'neckise]. Highest peak in Sweden, in Kjölon Mts (7,080 ft.).

Keekemet [kech'kenet]. Hungarian city 55 m. S.E. of Budapest; pop. 83,732, mostly Magyars; cattle market; trade in apples, apricots, flour, wine.

Kedah. State of the Federation of Malaya; area 3,600 sq. m.; pop. 554,441; 5-24.

Kedron. See **Kidron**.

Keel, Mts. See **Kidron**.

Keel, of ship, 7-41.

Keel, False. An extra keel fitted to a ship, often weighted, below the true keel, to help strengthen and stabilise the vessel.

Keelhauling. Former punishment for ratings guilty of serious offences in Brit. and other navies. Offender was hauled by ropes beneath keel from one side of ship to other. Often caused death.

Keeling Islands. See **Cocos Islands**.

Keelson. A timber or girder bolted over a ship's keel to stiffen the frame and improve the vessel's stability.

Keene, Charles Samuel (1823-91). Brit. pen-and-ink artist, for 10 years a contributor to *Punch*; foremost among Brit. craftsmen in his art.

Keep, of castle, 2-256.

Keeshond or **Dutch Barge Dog**. Breed resembling a large Pomeranian. Height 18 in. at shoulders. Tawny or grey. Tail curls up over body. Used as watchdog on Dutch barges.

Keewatin [kéwah'tin]. Former dist. of Canada, merged into Manitoba, Ontario, and N.W. Territories, 1912.

Keighley [kéth'li]. Tn. in West Riding of Yorkshire, 9 m. N.W. of Bradford; worsted, woolen, and machinery industries; pop. 56,938.

Keijo-fu. See **Seoul**.

Keitel, Wilhelm (1882-1946). Ger. Nazi war leader, signatory to German surrender. Tried as war criminal Nuremberg, 1945-46; hanged Oct. 1946.

Keith, Sir Arthur (1866-1955). Brit. anthropologist; conservator and professor at Royal College of Surgeons (1908-33); *Antiquity of Man The Human Body*.

Keith, Francis Edward James (1896-1758). Scot. soldier, Jacobite adherent, field-marshal under Frederick

the Great in Seven Years' War; prompt in action, skilful in tactics.

Kekulé [kákoolé] or **Kekulé von Stradonitz, Friedrich A.** (1829-96). Ger. chemist; devised "graphic formulae" for organic chemistry and suggested molecular structure of benzene; chemistry of explosives, dyestuffs, and coal-tar products based largely upon his researches.

Kelantan. State of the Federation of Malaya; area 5,750 sq. m.; pop. 448,572; 5-91.

Kelat (state). See **Kalat**.

Kelim Rugs. Type of Persian rug, 2-218.

Keller, Gottfried (1819-90). Ger. poet and novelist; b. Switzerland; chief work *Der Grüne Heinrich* (*Green Henry*), 4-11.

Keller, Helen Adams (b. 1880). Amer. writer, blind, deaf and dumb from infancy, 4-395.

Kellermann, François Christophe de (1735-1820). Fr. Revolutionary soldier, marshal of France, victor of Valmy (1792) over Prussians; father of François Étienne de Kellermann, one of Napoleon's ablest generals.

Kellogg, Frank 'Billings' (1856-1937). Amer. ambassador to U.K. (1923-25); secretary of state, U.S.A. (1925-29); was formerly a lawyer and a U.S. senator for Minnesota; awarded Nobel peace prize 1930.

• **Kellogg-Briand Pact** (1928). Pact to outlaw war, signed by all the principal nations in 1928; initiated by Frank B. Kellogg, U.S. secretary of state, in association with Briand of France; 2-56, 3-317.

Kells, Irish Rep. Old tn. in co. Meath, on the Blackwater; noted for antiquities, especially St. Columbkille's (Columba's) house.

Kells, Book of. Early Irish illuminated MS. of the Gospels, 3-130, 5-117, 2-2 illus.

Kelmscott Press, founded by William Morris, 5-267; page from, 5-266 illus.

• **Kelp**. A type of seaweed; commercial uses, 6-528, 1-105.

Kelso. Tn. in Roxburghshire, Scot. pop. 4,119; 6-460.

Kelt. Name given to a salmon after spawning has taken place, 6-489.

Kelvin, William Thomson, Baron (1824-1907). Brit. physicist, 4-395; and Atlantic cable, 2-153; translation of Hertz's works, 6-341; Joule-Thomson effect, 4-385; and radiation, 6-317; experiments with surface tension, 7-191.

Kelvin, r. of Scot., 21 m. long. Rises in Kilsyth Hills, Stirlingshire, and flows S.W. to join r. Clyde nr. Partick; 3-135.

Kelvin Scale, in thermodynamics 4-396.

Kemal Atatürk (1880-1938). Turkish nationalist leader and dictator, 4-396, 7-336; foundation of Ankara, 1-156; adoption of Rom. alphabet, 1-120; and Istanbul, 4-303.

Kemble, Charles (1775-1854). Brit. actor, brother of Mrs. Siddons and John Philip Kemble; appeared first at Sheffield in 1795; later played Macbeth in London and many other leading parts, chiefly comedy.

Kemble, Fanny (Frances Anne) (1809-93). Brit. actress and author, daughter of Charles Kemble; spent most of her later life in America (*Journals*, interesting picture of Amer. life).

Kemble, John Philip (1757-1823). Brit. actor, brother of Charles Kemble; made debut in London at Drury Lane as Hamlet; played in nearly all Shakespeare's tragedies.

Kempis, Thomas A. See **A Kempis**.

Kempsey, James Gomer Berry, Viscount (b. 1883). Brit. newspaper proprietor, 4-397; and Lord Camrose, 2-104.

Ken, Thomas (1637-1711). Eng. bishop and hymn writer ("Praise God from Whom All Blessings Flow"; "Awake, My Soul, and with the Sun").

KENYA, MOUNT

Kendal. Tn. in Westmorland, Eng.; pop. 18,540; 4-438, 7-445.

Kendal, Dame Margaret (1849-1935). Brit. actress; wife of W. H. Kendal (1843-1917), also an actor; greatest successes at St. James's in *Diplomacy*, *The Elder Miss Blossom*; made D.B.E. in 1926.

Kendall, Henry Clarence (1841-82). Australian poet, 1-321.

Kenilworth. Tn. in Warwickshire, Eng., pop. 10,738; 4-397.

Kenilworth Castle, and Scott's novel, *Kenilworth*, 4-397 with illus.

Kenmare Bay, Irish Rep. Inlet of Atlantic, between counties of Kerry and Cork; extends inland for 28 m., also known as Kenmare river.

Kennel Club, 3-103, 104.

Kennelly, Arthur Edwin (1861-1939). Amer. electrical engineer; and Kennelly-Heaviside layer, 6-344.

Kennelly-Heaviside Layer, measured by Appleton, 6-344.

Ken net, r. of Wilts. and Berks., Eng. flows 44 m. to join the Thames.

Kennet and Avon Canal, connecting Reading and Bristol, 86½ m. long, 2-205 illus. f.

Kenneth I, MacAlpine (d. c. 860). King of the Scots and conqueror of the Picts, often called first King of Scot.

Kennington. Dist. of S. London, opposite Kennington Park is the Oval, famous Surrey cricket ground.

Ken'sington. Parl. and royal bor. of W. London; pop. 168,051; Kensington Palace and Gardens; museum at Kensington include Natural History, Science Geological, and Victoria and Albert, 5-26.

Kensington Gardens, London, adjoining Hyde Park; originally laid out by William III as the grounds of palace at Kensington, enlarged and improved by Queen Caroline, contains Albert Memorial and statues of Queen Victoria and Peter Pan; other features are the Round Pond, Long Water, Broad Walk, and a replica of Watts' sculpture "Physical Energy"; area 256 acres, 5-26.

Kensington Palace, London, on the W. side of Kensington Gardens, birthplace of Queen Victoria (1819) here she received news of her accession. In 1948 became temporary home of the London Museum, 5-26.

Kent, Edward Augustus, Duke of (1767-1820). Brit. prince, 11th son of George III; father of Queen Victoria.

Kent, George, Duke of (1902-42). Brit. prince; fourth son of King George V; killed in air crash on active service; married (1934) Princess Marina of Greece, daughter of Prince Nicholas of Greece; three children: Edward (b. 1935), who succeeded to his title, Alexandra (b. 1936), Michael (b. 1942); 3-522.

Kent. S.E. co. of Eng.; area 1,525 sq. m.; pop. 1,563,286; co. tn. Maidstone, 4-398; hop gardens, 4-192 illus.; Walmer Castle, 7-137.

Kentish Glory Moth, 2-144 illus.

Kentish Men. Natives of Kent born on left bank of r. Medway. See *Men of Kent*.

Kentish Plover. Bird, 6-226; migration, 5-204 illus. f.; protective coloration, 6-296 illus. f.

Kent Sheep, 7-22.

Kentucky. State of U.S.A.; area 40,933 sq. m.; pop. 2,944,806; cap. Frankfort; 4-399.

Kentucky Derby [débí]. Amer. horse race for 3-year-olds, run annually over a course of 1½ m. at Louisville, Kentucky.

Kentucky River. In Kentucky, U.S.A., formed by several streams, rising in Cumberland Mts. of S.E.; flows 210 m. N.W. to Ohio r.

Kenya [kén'ya]. Brit. crown colony and protectorate in E. Africa; area 224,660 sq. m.; pop. about 5,406,000 of whom only 29,700 are Europeans; 4-399, 1-55; coral quarrying, 2-504.

Kenya, Mount. Peak which gives its name to Kenya colony; isolated mt. 17,040 ft.; 4-400, 1-61 illus.

KEPLER

Kepler, Johann (1571-1630). Ger. astronomer who formulated laws of planetary motion, 4-401.
Kepler's Laws of planetary motion, 4-401.

Keratin. Fibrous protein forming the outer layer of animal skin. In its toughest form, a constituent of hair, feathers, nails, claws, hoofs, and horns.

Kerbela [kê'bela] or **Karbala**. Tn. in s. Iraq, 60 m. s.w. of Baghdad; pop. 55,000; sacred city and place of pilgrimage of Shiite Muslims; tomb of martyr Hussein.

Kerch. Tn. and peninsula, at E. tip of Crimean peninsula, U.S.S.R.; twice taken by Ger. offensive in Crimea and Caucasus and twice retaken by Russ. between Nov. 1941 and Apr. 1944. Pop. of tn. 16,000.

Ker'ea. Tn. of Eritrea, on plateau of 6,000 ft.; natural stronghold defended by Italian troops from Feb. 6 to Mar. 27, 1941, against Brit. and Indian assaults; its fall opened the road to Asmara.

Keren'sky, Alexander Feodorovich (b. 1881). Russ. revolutionary statesman, head of the provisional govt. of 1917, 6-474; overthrown by Stalin, 7-141.

Kerguelen [kêr'gelen] Land. A desolate uninhabited volcanic isl. 85 m. long on s. border of Indian Ocean, midway between Cape of Good Hope and Australia; Fr. possession.

Kerkira. See **Corfu**.

Kerman [kêr'man] or **Kirman**. Prov. and city of s.e. Persia; area 60,000 sq. m.; pop. 600,000. Most of it is semi-desert. Pop. of city, 50,000.

Kermanshah. Tn. in s.w. Persia; pop. 106,000; 6-134.

Kern, Jerome (1885-1945). Amer. composer; wrote music for *Shore Boat, Cal* and *The Fiddle, Music in the Air, Swing Time*, etc.

Kern of Corn-daddy; a harvest doll; custom, 4-131.

Kerosene or **Paraffin**. A mineral oil; used in lamps, 4-143, 6-150.

Kerr's Pink. Variety of potato, 6-273.
Kerry. Co. in s.w. of Irish Republic, in prov. of Munster; mountain and lake scenery; Carratuohill, 3,111 ft., the highest peak in Ireland. Agriculture and fishing chief industries; area 1,815 sq. m.; pop. 126,620. Co. tn. Tralee.

Kerry Blue Terrier. Med.-sized, shaggy-haired breed of terrier; plucky and sagacious; puppies born black, become blue later.

Kerry Hills, Montgomeryshire, Wales, 5-255.

Kess'elring, F.-M. Albert (b. 1885). Ger. urman; chief of staff to *Luftwaffe* in 1936; directed air operations against Poland, 1939, the Netherlands, France, and Britain, 1940; in 1942 commanded Ger. air force and in Sept. 1943 all Ger. forces in It.; captured by U.S. 7th Army in 1945; in 1947 Brit. court in It. condemned him to be shot for massacre of It. civilians in the Ardennine caves; sentence was commuted to life imprisonment. Released 1952; pub. memoirs 1953.

Kesteven. One of the three parts of Lincs, Eng.; it is admin. from Skefford, 4-512.

Kestrel. A bird of prey (*Tinnunculus tinnunculus*). Commonest hawk in Gt. Brit., even nesting in London; distinguished by habit of hovering in one spot, whence name windhover; 4-140, 1-465 illus.; egg, 1-452 illus.; migration, 5-204 illus. f.

Kewick. Tn. of Cumberland, Eng.; pop. 4,868; 3-10, 4-438.

Ketch. Small sailing ship. Has tall mainmast, a shorter mizen mast aft, both rigged fore and aft, and carries two spinnails.

Ketch, Jack (d. 1686). Eng. public hangman notorious for his bungling the executions of Lord William Russell, 1683, and of Monmouth, 1685.

Kettaring. Tn. in Northants, Eng.; pop. 36,799; boot and shoe making, textiles, leather works, 5-456.

Kettle-drum. Type of drum, 3-128 with illus., 5-307.

Ketton Stone, a form of oolitic lime stone, 4-510.

Kew (kô). Dist. in Surrey on s. bank of the Thames; contains Royal Botanic Gardens; Kew Palace, rebuilt in 1631, became the palace of George III in 1781.

Kew Gardens. Botanic gardens at Kew, Surrey, 4-401.

Key, Francis Scott (1780-1843). Amer. lawyer. Author of *The Star-Spangled Banner*, now national anthem of U.S.A., 5-143; 5-326 27.

Key (music). See **Musical Terms** (H-4).

Keyboard, of "Monotype" machine, 5-246 with illus.

Keyes, Roger John Brownlow **Keyes, Baron** (1872-1945). Brit. sailor; commodore of submarine service, 1910-14; led historic naval raid on Zebrugge, 1918; commanded battle cruiser squadron of Atlantic Fleet, 1919-21; Admiral of the Fleet, 1930; M.P., 1934-43; Director of Combined Operations, 1940-41; created baron, 1943.

Keynes (kânz), **John Maynard Keynes, Baron** (1883-1946). Brit. economist; author of works on world finance, and economics; created baron, 1912; married (1925) Lydia Lopokova; 3-160

Keys. See **Locks and Keys**.

Keys, of piano, 6-195.

Keys, House of. Elected body of 21st members forming the lower house of the Court of Maryland, legislative assembly of Isle of Man, 5-110.

Keystone of an arch, 1-201.

Kezanlik Valley, Bulgaria; rose growing, 2-119.

Khabarovsk or **Habarovsk** [hahbah-rofsk]. Capital of Far Eastern Region of Asiatic Russia, at junction of Amur and Ussuri. Pop. 199,360.

Khadimain. Holy city of Iraq; great mosque, 4-280.

Khafrâ. Egyptian pharaoh c. 2867-2811 B.C.; Pyramid of, 6-312, 3-181; Sphinx as portrait of, 3-193, 7-130.

Khairpur. Former princely state of India, ceded to Pakistan, 4-251.

Khaki. Drab colour used for army uniforms; in Brit. army, 1-502.

Khan. Title of respect in Mahomedan countries, originally meaning sovereign. Jenghiz (1162-1227), the Mongol ruler, was first to call himself khan.

Khan [kuhn]. In Orient, unfurnished inn for travellers.

Khan, Liaquat Ali (1895-1951). Mahomedan politician; first prime min. of Pakistan; a leader of the Muslim League from 1936. Assassinated 1951.

Kharga. Oasis tn. in Egypt, pop. 10,000; 3-173.

Kharkov [hark'kov]. City in Ukrainian S.S.R., 2nd in one of the richest agricultural regions of world. Industries incl. iron smelting, steel mfr., chemicals and machinery. Pop. 833,000; 6-172, 7-491, 493.

Khartum [khar'tum]. Cap. of Sudan situated at junction of Blue and White Nile; pop. 82,763; 4-402; Gordon's death at, 4-48 with illus.

Nile, 5-439, 7-179.

Khatmandu. Cap. of kingdom of Nepal, pop. 108,000; 5-367.

Khedive [ked'év]. Title of former Turkish viceroy in Egypt. First granted in 1867, it existed until 1914, when the Khedive Abbas Hilmi was deposed by the British; title granted to Ismail Pasha (1867), 3-176.

Kherson [kêr'son]. Port on r. Dnieper in Soviet Russia, 100 m. E. of Odessa; pop. 97,000; grain, woolen mills, tobacco mfrs.; built by Potemkin, 6-474.

Khingan [king'an]. Mt. range in China; Great Khingan in N. Mongolia and N.W. Manchuria; continuation in N.E. Manchuria s. of the Amur, known as Little Khingan; 5-112.

Khiva [khé'va]. Cap. of former state of Khiva, now part of Uzbek Repub., U.S.S.R.; pop. 20,000; 1-266.

KIEV

Khmer Empire. Anc. empire (A.D. 500-1200) of Indo-China; remains, 2-181, 179 illus., 180 illus.

Khoisanforms. Division of the races of mankind; characteristics 6-334, 335 illus.

Khokand [kôkahnd'] or **Kokand**. Trade centre in Rus. Turkestan 275 m. E. of Bokham; pop. 84,000.

Khorasan [kôrâhsân'] or **Khurasan**. Mountainous prov. of N.E. Persia; a. 125,000 sq. m.; pop. 1,000,000; fruits, cereals, silk, carpets; cap. Meshed.

Khorasbad [korsahbâhd']. VII. of Iraq, near site of anc. Nineveh; remains of Assyrian art found in 1813-55.

Khotan. Chinese Turkestan, trade tn. in s.w.; pop. 18,000; 1-266.

Khrushchev, Nikita S. (b. 1894). First secretary of the Communist party of the U.S.S.R. from 1953; active in party affairs from his joining in 1918; agricultural expert.

Khufo or **Cheops** (c. 2800 B.C.). Egyptian king of the 4th dynasty; and the Great Pyramid, 6-312, 3-184; portrait, 7-3 illus.

Khurasan. See **Khorasan**.

Khyber [kî'ber], or **Khalbar**, Pass. Narrow mt. pass between Pakistan and Afghanistan; length 33 m., narrowing to 15 ft. wide; great strategic importance for 2,000 years; the rly. to the head of the pass was opened in 1925; 1-46, 47, 6-41 illus.

Kiang [kiang']. Wild animal of Asia, resembling both ass and horse.

Kiangai [kiang'si]. An inland prov. of China; 77,000 sq. m.; pop. 13,794,000; pop. Nanchang; coal, iron, copper, tea, tobacco, silk.

Kiangsu. A maritime prov. of cent. China; 41,000 sq. m.; pop. 36,161,000; cap. Chienkung; chief city Shanghai; one of China's richest and most fertile regions.

Kiaochow [kiow'chow]. Tn., bay, and dist. on E. coast of Chinese prov. of Shantung; ceded to Japan by Treaty of Versailles, 4-350.

Kidd, William (c. 1650-1701). Brit. pirate, 4-402, 6-206.

Kid'ermister. Tn. in Worcestershire on r. Stour; pop. 37,123; noted for mfr. of carpets; 2-249.

Kidney Bean. Kidney-shaped seed of any plant of the common bean type. See **French Bean**.

Kidney or Brazilian Cotton. Group of cotton plants the seeds of which are covered by long hairs easily and cleanly removed to leave seeds in each compartment of capsule united in a more or less kidney-shaped mass.

Kidneys. In human body, 4-403, 3-90.

Kidron [kid'ron], **Kedron**, or **Cedron**, Valley of. Deep depression E. of Jerusalem where brook flowed in anc. times; 4-361.

Kiel. See **Kiel**.

Kiel [kîl]. Spl. of W. Ger., cap. of the Land of Schleswig-Holstein; pop. 218,000; shipyards, iron mfrs.; mfr.; terminus of Kiel Canal; 4-3.

Kiel Canal. Artificial waterway connecting the North and Baltic seas, completed and opened, 1895, as the Kaiser Wilhelm Canal; 61 m. long; declared an international waterway 1913 and again in 1945; 7-480.

Kielese [kyel'sel]. Poland. City in mts. 95 m. S. of Warsaw; pop. 58,000; formerly noted for copper mines, no longer worked; mfrs. of hemp, brick, paint; German-occupied in 2nd World War, captured by Russians Jan. 1945; scene of pogrom July 1946.

Kierkegaard [kêr'kegawr] **Søren Aabye** (1813-55). Danish philo-sopher; immense influence on Danish literature (*Either-Or*).

Kieselguhr [kêzelgoor]. An absorbent earth used by Alfred Nobel in his early invention of dynamite; as polishing powder, 1-448.

Kiev. City on r. Dnieper, cap. of the Ukraine S.S.R.; pop. 846,300; 4-403, 6-472; 7-491, 193; captured by Oleg, c. 880, 6-473.

KIKUYU

Kikuyu. Native people of Kenya; *Man* activities, 4-400, 401 illus.
Kilauea. Volcano in Hawaii, 7-405.
Kildare. Co. of Irish Rep., in prov. of Leinster. Pastoral country; includes the Curragh, a centre of racehorse breeding. Many anc. round towers found throughout county. Area 654 sq. m.; pop. 64,849. Co. tn. Kildare.
Kildare. Old tn. in Irish Rep.; pop. 2,386; site of 5th cent. nunnery.
Kilimanjaro (kilimanjaro). Double-peaked volcano mt. in Tanganyika Territory, 19,300 ft., 1-49, 7-221.
Kilkenny. Co. of Irish Rep., in prov. of Leinster; agricultural and pastoral country; flour, whiskey and beer produced. Area 796 sq. m.; pop. 65,113; co. tn. Kilkenny.
Kilkenny. Co. tn. of Kilkenny co., Irish Rep.; pop. 10,570.
Killarney. Irish Rep. Small market tn. in s.w. in co. Kerry, near Killarney Lakes; pop. 6,300; market day, 4-286 illus.
Killarney, Lakes of. Ireland, 4-281 286 illus.
Killer Whale. 1-169, 7-446 illus.
Kilmerankie. Pass in Perthshire, Scot. Viscount Dundee, leader of Jacobite Highlanders, killed in victory over royal forces in 1689.
"Kilmainham Treaty." Informal agreement made in 1882 between Parnell, then in Kilmainham prison, Dublin, and the Liberal Party leaders, promising Irish Home Rule support of Liberal measures in Ireland. The agreement was ended by the Phoenix Park Murders (q.v.).
Kilmarnock. Scot. Tn. on Kilmarnock Water, in Ayrshire; pop. 42,600; industries incl. engineering, distilling, dyeing, lace and carpet-making, hosiery and footwear.
Kilmuir. Viscount (b. 1900). Sir David (Patrick) Maxwell Fyfe, Brit. lawyer and politician; onnoble and made lord chancellor 1954.
Kila. for pottery, 6-276; for bricks, 2-60.
Kilocycle (kc.). Frequencies of electromagnetic waves are often expressed in kilocycles per second (kc/s).
Kilogram (kg.). A unit of weight in the metric system, 1,000 grams (2 204 lb.), 5-184.
Kilolitre (kl.). A unit of volume in the metric system; 1,000 litres (220 gal.).
Kilometre (km.). A metric unit of length (3,281 ft.).
Kilowatt (kW.). Unit of electrical power equal to one thousand watts. It is approximately 1.34 British horsepower, 4-217.
Kilowatt-hour (kWh.). British board of trade unit of electrical work. It is the work done when a rate of work of 1,000 watts (electrical) is maintained for one hour.
Kilravock. Village in Nairnshire, Scot., 5-314.
Kilt. Short pleated skirt or petticoat reaching from waist to knee. One of the oldest forms of male costume. Best known as male nat. dress of Scottish Highlanders. *See Tartan.*
Kimberley. 8 African diamond-mining centre, Cape of Good Hope prov.; white pop. 19,915, diamond fields, 7-91, 92, 1-52.
Kimberley. Gold-mining centre in W. Australia.
Kimberlite. Rock composed of silicate minerals; diamonds found in, 3-83.
Kimono. Loose robe worn by Japanese of both sexes as outer garment. Has no fastenings but is wrapped round body and secured by a silk girdle.
Kim's Game. and visual memory, 5-167.
Kinangop. Mt. Kenya, 12,773 ft.; highest peak of the Aberdare Mts., 4-400 illus.
Kincaid. Scotland. Tn. of Fife, on Firth of Forth; sail-making; pop. 3,600; swing bridge, 3-67 illus.
Kincardineshire. Co. of Scot.; area 383 sq. m.; pop. 47,341, 4-404.
Kinshasa. Mt. Third highest peak in world (98,146 ft.) in s. Himalayas; climbed by four of Charles Evans's party, 1935, 1-264, 4-176, 177.

KIRKCALDY

Kindergarten. Nursery school, 3-471.
Kinder Scout. Mt. in Derbyshire, 2,088 ft., 3-76, 6-118.
Kinematic Relativity. modification of General Theory of Relativity, 6-382.
Kinetic Energy. 3-245.
Kinetic Theory. of gases, 3-508, 5-150.
Kinetoscope. Moving picture peep-show invented by Edison, 3-389, 392.
King. Playing card, 2-221 illus.
King. Chess piece, 2-330.
King. (William Lyon) Mackenzie (1874-1950). Canadian statesman and economist; minister of labour (1909-11); economic research for Rockefeller Foundation (1914); premier of Canada (1921-26, 1926-30, and 1935-48).
King Charles Spaniel. Dog, 3-100 illus. f.
King Class. of locomotives, 5-4 illus. f. 5-10 illus.
King Cobra or Hamadryad. 2-436.
King Crab. Group of marine arthropods differing in several respects from true crabs. Occur on k. coast of N. Amer., off coast of China, Japan, and Indo-Pacific isls. Spike like tail, unable to swim.
Kingcup (flower). *See Marsh Marigold.*
Kingdom. In natural science the three primary and largest divisions in classification of all natural objects; i.e. the animal, the vegetable, and the mineral kingdoms.
Kingdom of the Two Sicilies. State formed by union of Sicily and Naples in 1136, included other parts of s. Italy at various times; Naples as cap., 5-317.
King Edward. Variety of potato, 6-273.
Kingfisher. A fish-eating bird, 4-404; egg, 1-432 illus. f.
King George V. H.M.S. Battleship, second of name, completed 1940, laden displacement 44,650 tons, in action which sank the *Bismarck* in 1941; covered Allied landings in It.; served with Pacific Fleet against Jap. and Jap.-occupied islands.
King George VI Sound. Antarctica, discovery by Rymill, 6-247.
King George's War. Name given by the Brit. colonists to the conflict in Amer. between Fr. and Brit. (1744-48) (War of the Austrian Succession).
Kinglake. Alexander William (1809-91) Brit. historian, author of *Kothen*, a splendid record of travel and an exhaustive history of the Crimean War, 3-291.
King Lear. Tragedy by Shakespeare, 4-409.
King Log and King Stork. Fable by La Fontaine, 4-437 illus.
King of the Devils. Siamese god of death, 7-44 illus. f.
King Penguin. 6-116 with illus. f.
Kings. Eleventh and twelfth books of the Old Testament, usually written 1 Kings and 2 Kings, dealing with the period that embraces the reigns of all the kings of Israel except Saul and David.
Kings and Queens of Eng. and Gt. Brit. *See under England.*
King's Bench. *See Queen's Bench.*
King's Champion. Hereditary office at Coronation banquet, 2-510.
King's College. Aberdeen Univ., 1-5.
King's College. Cambridge Univ., 2-182, chapel illus. f.; and Eton, 3-304.
King's College. Durham Univ., 3-140.
King's College. London Univ., 5-33.
King's Counsel. *See Queen's Counsel.*
King's Cross Station. London. Built 1852 on site of a smallpox hospital. Originally terminus of the Great Northern Ry., later London and North Eastern Ry.; now terminus of N.E. Region of Brit. Ry.
King's Cup. Principal Brit. air race; open to Brit. civil aircraft and pilots only; run on a handicap basis.
King's Evidence. *See Queen's Evidence.*
King's Evil. Old name for scrofula. So called because it was once supposed that the touch of a king cured it.
Kingsford-Smith. Sir Charles Edward (1897-1935). Australian airman made first trans-Pacific flight in 1928, record-breaking flight from Australia to Eng. in 1929, and

from Eng. to Australia in 101 days in 1930, 1-42, 44, 1-34 illus.
"King's Friends, The." Political party of George III, 3-521.
Kingsley, Charles (1818-75). Brit. clergyman and novelist, 4-409 3-291, 2-356, 357; extract from *The Water Babies*, 4-409; poems 2-104 illus. f.; and Newman, 5-389.
Kingsley, Henry (1830-76). Brit. novelist, younger brother of Charles Kingsley (*Ravenshoe*).
King's Library. British Museum postage stamp collection, 2-80.
King's Lynn. Spt. tn. of Norfolk on the Great Ouse, 2 m. from the Wash, shipping trade and shipbuilding industry; pop. 26,173, 5-448.
Kings of Cologne, The Three. Caspar, Melchior, and Balthasar, the wise men who according to old tradition visited Bethlehem at Christ's birth. Their bodies are said to have been taken to Cologne by the Emperor Frederick in 1162.
King's Police and Fire Services Medal. Decoration awarded to members of any official police force or fire brigade in Gt. Brit. and the Commonwealth for acts of exceptional gallantry and devotion to duty, estab. 1909.
King's Prize (Bisley). *See Queen's Prize.*
King's Reach. Name given to the Thames between Westminster Bridge and London Bridge, 7-263.
Kingston. Canada, at N.E. end of L. Ontario, historic city commanding entrance to St. Lawrence I., ship building and engineering industries pop. 33,459, 5-513.
Kingston. Cap. and spt. of Jamaica pop. 109,000, 4-337, 338 illus.
Kingston-upon-Thames. Royal borough and co. tn. of Surrey on s. side of the Thames, 12 m. s.w. of London, breweries, flour mills; scene of crowning of old Anglo-Saxon kings pop. 40,168, 7-196.
Kingston-upon-Hull. *See Hull.*
Kingstown (Ireland). *See Dun Laoghaire.*
King's Troop. Of the Royal Horse Artillery, 1-250.
Kingtehehen (kingtēchen). Large mart. of s.e. China, in prov. of Kiangsi on r. Chang, pop more than 300,000; great porcelain centre.
King William's War (1689-97). Part of Anglo-French struggle for N. Amer.
Kinkajou. Small, carnivorous mammal of the raccoon family, native to Cent. and S. Amer. Length 30 in. incl. prehensile tail. Reddish-brown. Feeds on birds, insects, eggs, fruit.
Kinlochleven. Argyllshire, Scotland aluminium production, 1-128.
Kinross. Co. tn. of Kinross-shire, Scot., pop. 2,495, 4-412.
Kinross-shire. Co. of Scot., area 82 sq. m., pop. 7,418; co. tn. Kinross, 4-412.
Kinsale. Irish Rep. Spt. on Kinsale Harbour, 17 m. s. of Cork, important fisheries; pop. 1,928.
Kintyre. Mull of, Scot. Peninsula at the extreme south of Argyllshire has a lighthouse.
Kjolen mts. *See Kjølen mts.*
Kipling. Rudyard (1865-1936). Brit. writer, 4-412, 3-291 f. children's books, 2-354.
Kipper. Dried, cured herring, 4-171.
Kirchhoff (kērk'hof), Gustav Robert (1824-87). Ger. physicist, developed spectrum analysis (with Bunsen).
Kirghiz (kērg'gēz). Nomadic people of cent. Asia, of Turko-Tataric (Mongolian) origin, ranging from border of European Russia to w. China.
Kirghiz S.S.R.; area 76,900 sq. m. pop. 1,600,000, 4-413, 6-475.
Kirin (kē'rin). Prov. of Manchuria, a 101,000 sq. m. pop. 4,504,000, traversed by r. Sungari on which Kirin (pop. 139,900), the capital, tobacco, wheat, maize, millet are grown, 5-112.
Kirk. Name given to a church in Scot., 4-414.
Kirkcaldy (kērkaw'di). Spt. tn. of Fife, Scot., pop. 49,037, 4-414
linoleum mfrs. 3-356.

KIRKCUDBRIGHT

Kirkcudbright [kerk'ub'rl]. Co. tn. of Kirkcudbrightshire, Scot., pop. 2,496 4-415, 414 illus.

Kirkcudbrightshire, Co. of Scot.; area 900 sq. m.; pop. 30,742; co. tn. Kirkcudbright, 4-414.

"**Kirkie's Lamb**." Nickname of the Queen's Royal Regt. (West Surrey). Derived from its colonel, Percy Kirke (c. 1645-91) and regimental badge, a lamb; often used in sarcastic reference to its brutalities committed against Monmouth's followers and sympathisers after the battle of Sedgemoor (1685).

Kirk-Killise, also Kirk-Killisch or Sarandekilise. Tn. 25 m. N.W. of Adrianople (Edirne), Turkey; pop. 16,000.

Kirk Session, Scot. ecclesiastical court, 4-414.

Kirkstall Abbey, Leeds, Eng., 1-3, 4-475.

Kirkuk, Tn. in Iraq; oil field, 4-280.

Kirkwall, Cap. of Orkney Isls., on Mainland; pop. 4,348, 6-4, 5 illus.

Kirriemuir, Market tn. of Angus, Scot. Birthplace of Sir James Barrie, who made it famous as "Thruwa." Pop. 3,500.

Kirsch or Kirschwasser. Liqueur made in Ger. from black cherries.

Kish. Ruined city of Iraq, 100 m. S. of Baghdad between riva Tigris and Euphrates. Earliest known cap. of the Sumerians.

Kishinev. Cap. of the Moldavian S.S.R., 6-478.

Kiska. Isl. of the Aleutians, 1-90.

Kismayu, Tn. of Italian Somaliland. Shipping and fishing chief industries; pop. 3,000, 7-84.

Kissengen, Ger.; Spa in Bavaria, 60 m. E. of Frankfurt-on-Main; salt springs known from 9th cent.

Kistna, r., India, rising in Bombay state, flows 600 m. through Hyderabad state to Bay of Bengal; delta extends 100 m. inland, 4-240.

Kisumu. Port and cap. of Nyanza prov. Kenya, 4-400.

Kiawa, The. A pall of black silk covering Kaaba shrine at Mecca 5 156.

Kital. Tartar name for China, 2 368.

Kital Gorod. City built by Mongols within Moscow, 5-268.

Kit-Cat Club. A London club named after Christopher (Kit) Cat, the proprietor of the tavern in which the members met. It flourished from 1703-20; Sir Godfrey Kneller painted the members' portraits which, owing to the lowness of the room in which they were to hang, were half-length, a size that became known as kit-cat.

Kitchen. A modern example, 2-497 illus.

Kitchener of Khartum, Horatio Herbert Kitchener, Earl (1850-1916). Brit. soldier, 4-416.

"**Kitchener's Army**," in First World War, 4-415.

Kite. Bird belonging to the *Accipitridae* family, 4-415.

Kite-fighting, Asiatic sport, 4-416.

Kites and Kite-flying, 4-416, 1-31.

Kitimat, British Columbia, Canada; hydro-electric development, 2-81.

Kitool. A wood fibre, from India and Ceylon, used for making bristles of scrubbing brushes.

Kir's Coty House. Stone Age burial chamber in Kent, Eng., 7-162.

Kittatinny Mts., New Jersey, U.S.A., favourite holiday resort, 5-398.

Kittiwake. One of the smallest gulls, common off N. of Britain; white plumage, pale blue-grey back; very graceful flight, 4-106, 107 illus.

Kitty Hawk, N. Carolina, U.S.A.; scene of Orville Wright's first flight (1903), 2-245.

Kiyushu, Japan. Same as Kyushu.

Kiwi. See Apteryx.

Kjolen Mts., Norway, on border between Norway and Sweden; highest point Sulisteima, 6,180 ft., 6-462.

Klagenfurt. Important mfg. city of Lower Austria; pop. 62,782; chief city of Klagenfurt region (800 sq. m.) which voted to remain in Austria after 1st World War.

KOLCHAK

Klaipeda or Memel. Spt. of Lithuania on Baltic; iron foundries, ship-building, chemical and soap factories; pop. 35,900, 4-524.

Klang River. In Malay peninsula; flows by Kuala Lumpur. Scene of fighting with Japanese, Dec. 1941.

Klaproth, Martin Heinrich (1743-1817). Ger. chemist, prof. at Berlin univ. from 1810; discovered titanium, 7-282; uranium, 7-370.

Klausenburg. See Cluj.

Kléber, Jean Baptiste (1753-1800). Fr. Rev. general, one of greatest of epoch; assassinated while conquering Egypt.

Klee [klä], Paul (1879-1910). Swiss painter; under influence of Picasso became a Cubist; later an Abstract expressionist using Surrealist imagery.

Kleist [klist], Heinrich von (1777-1811). Ger. romantic dramatist and poet; chief works, *Penthesilea*, *Der zerbrochene Krug* (*The Broken Pitcher*), 4-13.

Klompfen. Wooden shoes worn by Dutch, 5-377, 378 illus.

Klon'dike. A gold-mining dist. in Yukon Territory, Canada, scene of great gold rush in 1896-8, 1-90, 4-39, 7-520.

Klopstock, Friedrich Gottlieb (1724-1803). Ger. epic, lyric and dramatic poet; helped free Ger. literature from foreign, especially French, influence, 4-13.

Kloster Zeven, Convention of (1757). Made between Hanoverians and Fr. Arranged by King of Denmark to prevent spread of Seven Years' War, 7-2.

Kneller [nel'er], Sir Godfrey (1646-1723). Court painter to Charles II and succeeding Eng. sovereigns to George I., b. Germany; buried in Westminster Abbey, 3-259; portrait of Marlborough, 6-132; portrait of Wren, 7 501.

Knickerbocker, Diedrich. Pretended author of Washington Irving's burlesque history of New York City. The Knickerbocker were an old Dutch family, and the name is now commonly applied to descendants of the original Dutch settlers of New York, 4-296.

Knight, Dame Laura. Brit. painter; specialised in scenes from circus and stage life; elected A.R.A. (1927) and R.A. in 1936; m. Harold Knight, portrait painter.

Knight, Thomas Andrew (1759 1834). Brit. horticulturist; work on apple varieties, 1-186.

Knight, chess piece, 2 330.

Knighthood, 4-417; armour, 1-244; orders of, 5-530.

Knighthon. Tn. in Radnorshire, Wales, near Offa's Dyke; pop. 1,836, 6 353.

Knights Bachelor, 4-418.

Knights Hospitallers of St. John of Jerusalem. Members of an ancient order of chivalry; took title from a hospital of St. John at Jerusalem about 1070; at Malta, 5-98; at Rhodes, 6-393; and Crusades, 3-2.

Knights Templars. Crusading order of knights, 4-418, 3-2 with illus.

Kniller, Gottfried. See Kneller, Sir Godfrey.

Knitting by Hand and Machine, 4-418; knitted goods, 2-420.

Knitting Needles, early types, 4-418.

Knives and Forks, 4-390.

Knocking. In internal-combustion engines; anti-knocking compound, 4-121.

Knockmealdown Mts., Ireland, 4-281.

Knole. Seat of Lord Sackville, nr. Sevenoaks, Kent; fine mansion containing Great Hall and Galleries, built early in 17th cent.; earlier building taken by Henry VIII from Cranmer, and afterwards given to Thomas Sackville by Queen Elizabeth I; National Trust property, part being leased to Lord Sackville; stands in large deer park, 4-398.

Knossos. Anc. capital of Crete; Evans's discoveries, 1-205; remains, 2-227; excavations, 1-25; fresco, 1-24 illus.; marble throne, 1-23 illus.

Knot. Small wading bird about 9 ins. in length, with long legs and long slender bill, and grey in colour. In winter vast numbers visit E. and S.E. coasts of Brit. from the Arctic, where they breed in summer.

Knot. Nautical unit for measuring a ship's speed, 5 16.

Knotgrass. Small plant, *Polygonum articulare*, fam. *Polygonaceae*; trailing recumbent, matted stems, small simple leaves at base of which are tiny pink and white flowers; grow as a weed in gardens and is common in waste places.

Knots, Hitches, and Splices, 4 421.

Knox, John (c. 1514 72). Scot. protestant leader, 4-423, 6-512, 6-111, in Edinburgh, 3-161.

Knox, Ronald A. (b. 1888). Rom. Cath. priest and translator of Bible, 1-443.

Knoxville, Tennessee, U.S.A. In E. on Tennessee r., mfg. city and distributing point for mining and agricultural region; pop. 124,183, 7-256.

Knutsford. Village of Cheshire 15 miles S.W. of Manchester, the "Cranford" of Mrs. Gaskell's story, 2-328.

Koala. The tree-hug of Australia, 4-424, 5-137, 1-315 illus.

Kobe [kô'bâ], Japan. Important spt. in S. of Isl. of Honshu; pop. 979,290; great shipyard, 4-340, 342.

Koblenz. See Coblenz.

Ko'bol or Gnome. In Ger. folk-lore, a teasing, mischievous elf; metal cobalt called after, 2 434.

Koch [kok], Robert (1813 1910). Ger. physician and bacteriologist, 4 14, 1-343, 6-93; portrait, 6 163; studied tuberculosis, cholera, and tropical fevers; discovered tubercle and cholera bacilli; 1905 Nobel prizewinner in medicine.

Kocher [kôk'her], Emil Theodor (1841-1917). Swiss surgeon, first to operate successfully for exophthalmic goitre; 1909 Nobel prizewinner in medicine.

Kodaly, Zoltan (b. 1882). Hungarian composer. Works include string quartets, sonatas and songs. Collected some 4,000 Hungarian folk songs, 4 206.

Kodiak Island. Off coast of Alaska, S. of Cook Inlet; 36,000 sq. m.; greatest salmon fisheries in Alaska; growing agric. and grazing industries, 1-89.

Koenig [kên'ig], Gen. J. M. P. (b. 1898). Fr. soldier; served in Narvik campaign, April 1940; fought in Brittany against invading Germans, escaped to Gen. de Gaulle in Eng.; in 1944 chief liaison officer between Eisenhower and Free French forces of which he became head; milit. gov. of Paris on its liberation, Aug. 1944; as c.-in-c. Fr. forces in Ger. was on Allied Control Commission.

Kohima [koh'nah]. Tn. of Assam, India, in dist. of same name; successfully defended by British when isolated by the Jap onslaught of Apr. 1944; invasion of India averted after 40 days' fighting by relieving the 14th army, 1-276, 7-496.

Koh-i-noor. Famous diamond, one of the Brit. crown jewels, 3-84, 82 illus., 1-69, 2-536.

Kohl-rabi. Vegetable of the cabbage family, 2-151.

Koko-Nor (Blue Lake). Lake in cent. Asia, 1-264.

Koksoak River, Quebec. Largest river in Labrador peninsula; flows N. 500 m. to Ungava Bay.

Kola Peninsula. A mountainous peninsula of Russia between the Arctic Ocean and the White Sea; 50,000 sq. m. Its N. coast, called the Murman Coast, has several ice-free ports. See Murman Coast.

Kolchak, Alexis (1875-1920). Former Imperial Rus. naval officer; headed Omak govt. (Nov. 1917 to Jan. 1920), recognized by the Allies as *de facto* Rus. govt.; organized Siberian anti-Bolshevik army and held country nearly to Volga before 1919 summer campaign of Red Army forced retreat and collapse of his govt.:

KOLIN

executed by Irkutsk revolutionary commission.

Kolín [kó'lin], Czechoslovakia. Tn. on r. Elbe, 30 m. w. of Prague; pop. 16,000; Austrians defeated Frederick II of Prussia (1757), securing evacuation of Bohemia.

Kollnaky, fur, 3-496.

Kolovsar. See *Cluj*.

Komarno [kó'mahrnó], or **Komorn**, Czechoslovakia. Tn. on Danube, 50 m. s.e. of Bratislava; pop. 21,000; surrendered to Austrians (1840) after brilliant defence in Hungarian rev.; grain and timber trade.

Komodo. One of the Lesser Sunda Is., Indonesia; "dragon" lizards, 3-112, 4-529.

Konakry. Chief tn. of Fr. Guinea, W. Africa; pop. 39,000; iron-ore fields, 4-293.

Konia or **Koniak**, Turkey. City on Anatolian rly., 280 m. s.e. of Istanbul; pop. (1945) 58,800; anc. Iconium; became Seljuk cap. in 1097; taken by Frederick Barbarossa in 1100; annexed to Turkey in 15th cent.; famous medieval orchards; carpets, textiles.

Koniev [kon'yef], **Ivan Stepanovich** (b. 1897). Russ. Red army soldier of 2nd World War. On April 16, 1945 (with Zhukov) advanced on Berlin and encircled the city, where resistance ceased on May 2.

König [kó'nig], **Frederick** (1774-1833). German inventor, who built the first practical steam-printing machine; on one of his machines *The Times* was printed for many years, starting from 1814.

Königsgrätz [kó'nig'grätz]. (Czechoslovakia. Small city 65 m. E. of Prague; 13th cent. cathedral; varied mfrs.; battle of Sadova or Königsgrätz (1866) in Austro-Prussian War fought near by.

Königsberg [kó'niks'bärg]. Formerly fortified sp., cap. of E. Prussia, on r. Pregol; large univ.; bombarded in 1914; captured Jan. 1945; incorporated as Kaliningrad into U.S.S.R. in 1945, 4-4.

Koninck, Philip de (1619-88). Dutch artist; studied under Rembrandt; landscapes and portraits, 5-384.

Konstanz (Ger.). See *Constance*.

Kookaburra, or laughing jackass, Australian bird, 1-312, 315 illus.

Kopeck. See *Money* (list).

Köpenick [kó'penik], Captain of. Name by which Wilhelm Voigt, perpetrator of hoax at that German town in 1906, was known; shoe-maker and ex-convict, he donned a guards officer's uniform, arrested both burgomaster and treasurer, and appropriated a large sum. He was arrested a week later.

Kopje [kop'j]. Flat-topped S. African hill, 1-502.

Koran. Sacred book of Mahomedans, 4-424, 5-88.

Korda, Sir Alexander (1893-1956). Brit. film producer. Hungarian-born, but naturalised British. Films include *The Private Life of Henry VIII*; *Lady Hamilton*, *Things to Come*, *The Sound Barrier*. Knighted in 1912.

Kordofan [kordó'fahn]. A prov. in the Sudan, Africa.

Korea. Peninsula of E. Asia between the Sea of Japan and the Yellow Sea; area 85,000 sq. m.; 4-425; annexed by Japan, 1-272, 4-340; Korean War, 7-354, 1-244, 7-363; MacArthur, 5-57; armistice signed July 27, 1953.

Korean Jade. See *Serpentine*.

Korin School. Of Jap. art named after Koyetzu (1552-1637), 4-353.

Korotkov, **Laurus Georgievich** (1870-1918). Russ. general, commanded in Galician campaign during 1st World War; his abortive mutiny against Kerensky (1917) prepared way for later Bolshevik victory; killed in battle against Red Army while leading Volunteer Army in "ice fight" in the Kuban.

Kortrijk. See *Courtrai*.

Koruna. See *Money* (list).

KUBAN RIVER

Korzenowski, **Joseph K.** See *Conrad*, *Joseph*.

Kosciusko, **Thaddeus** (1746-1817). Pol. patriot; rising defeated, 6-240.

Kosciusko, **Mount**. Highest peak in Australia, 7,328 ft., 5-402, 1-316.

Kosher [kó'sher]. Jewish term for food made ceremonially clean; especially applied to meat slaughtered in a way ensuring complete bleeding of the body.

Koshantau, Mt. in Caucasus range (16,881 ft.), 2-274.

Kosice. City of Czechoslovakia, largest in the area ceded to Hungary in Oct. 1938; 130 m. n.e. of Budapest; pop. 58,000 mostly Magyars and descendants of Germans who founded city before 12th cent.; 14th cent. Gothic cath.; restored to Czechoslovakia in 1945; 3-22.

Kossuth, **Lajos**, or **Louis** (1802-91). Hungarian leader of revolt against Hapsburgs (1848); became virtual dictator; fled to Turkey in 1849 when revolution was crushed; lived abroad, having been deprived of Hungarian nationality, 4-207.

Kota Bharu. Cap. and sp. of Kelantan, Federation of Malaya; nr. mouth of Kelantan r.; pop. 14,843; here the Japs made their first landing in Malaya, Dec. 7, 1941, 2nd World War.

Koto [kó'tó]. A Japanese harp consisting of a long box over which are stretched 13 strings, each with a bridge; played with both hands and tuned by shifting the bridges.

Kotor, formerly **Cattaro**. Sp. of Yugoslavia; a famous beauty spot of Montenegro; pop. 5,000.

Kotzebue [kót'sebue], **August Friedrich** von (1761-1819). Ger. playwright, very prolific and popular over all Europe; best-known play translated as *The Stranger*.

Koumiss. Tartar drink made from fermented mare's milk; prepared in Europe and America from cows' milk, 5-205.

Koussevitzsky [kousevít'ski], **Serge** (1874-1951). Russian conductor. Founded orchestra in Russia. After revolution left to work in London, Paris, and Boston, U.S.A.

Kovno (Lithuania). See *Kaunas*.

Kowloon. Small peninsula of China included in Brit. colony of Hong Kong, 4-191.

Kowtow (Chinese, knock-head) Chinese salutation expressing homage, respect or worship, performed by kneeling and touching the ground with the forehead. In English, the term is used figuratively for any act or attitude of undue servility.

Koxinga. Chinese pirate, who ruled Formosa for 22 yrs., 3-121.

Koyetzu (1552-1637). Jap. artist; and Korin school, 4-353.

Kraal. Native village of S. and E. Africa, consisting of huts built round a cattle enclosure, often protected by a stockade of wood or thorn bushes.

Krafft or **Kraft**, **Adams** (about 1455-1507). Principal Ger. sculptor of late Gothic period; his masterpiece, pyramid 64 ft. high, remarkable for its rich and delicate decorations in figures and relief and its architectural beauty.

Kra Isthmus, Siam; vegetation, 7-46.

Krait. Highly-poisonous land snake, 7-75.

Krakatau. Volcanic isl. between Sumatra and Java, Indonesia; eruption in 1883, 7-405.

Krasnodar. Tn. in Caucasus, U.S.S.R.; centre of mfg. dist.; pop. 204,000.

Krasnoyarsk [kráshnó'yarsk'], Siberia, U.S.S.R. City on Yenisei r. and Trans-Siberian Rly.; pop. 190,000; centre of gold washings of Yeniseisk dist.

Krefeld [krá'feld] or **Crefeld**. Tn. in Land of North Rhine-Westphalia, Ger.; pop. 170,482; textiles, 4-5; famous technical school; battle of (1757) in Seven Years' War, 7-2.

Kreisler [kriz'ler], **Fritz** (b. 1875). Austrian violinist and composer,

generally conceded to be one of the greatest of modern violinists; works include "Caprice Viennoise".

Kremlin. Citadel of Moscow, 5-268, 6-473 illus. f.

Kreutzer [kroitz'er], **Rudolph** (1766-1831). Fr. violinist of Ger. extraction; Beethoven dedicated to him his "Kreutzer Sonata".

Kriemhild. Beautiful princess in the *Song of the Nibelungs*, 5-429.

Kris. Malay knife, with wavy blade.

Krish'na. A Hindu god, eighth incarnation of Vishnu; Javanese ritual play, 3-42 illus.

Kristiansand. Sp. and tn. in Norway; pop. 24,343; shipbuilding, timber, wood pulp and fish exports; 5-461.

Kristos. Gk. form of Hebrew word Mashiach or Messiah; title given to Jesus, 4-363.

Krivoi Rog. Tn. of Ukraine, S.S.R.; 90 m. s.w. of Dnepropetrovsk; industrial tn. with large iron mines; pop. 197,621; taken by Ger. advance Aug. 17, 1941, retaken by 3rd Ukrainian Army Feb. 22, 1944; 6-479.

Krona. See *Money* (list).

Krone. See *Money* (list).

Kronfeld, **Robert** (1904-48). Austrian-born British glider pilot; held many records (over Alps, double Channel crossing, etc.); sqdn.-ldr. R.A.F. in 2nd World War; killed in glider crash.

Kronos. See *Cronos*.

Kronstadt. Rus. port and fortified city on isl. of Kotlin in Gulf of Finland 31 m. w. of Leningrad; pop. 43,800; founded 1710 by Peter the Great.

Kropot'kin, **Peter**, **Prince** (1842-1921). Rus. geographer and revolutionary, first to show that structural lines of physical Asia run s.w.-n.e.; imprisoned and exiled.

Kruger [kroo'ger], **Paul** (1825-1904). Boer patriot, known as "Oom Paul" ("Uncle Paul"); pres. of S. African Republic (Transvaal) 1883-1901, 1-502.

Krugers National Park. Game reservation in Transvaal, S. Africa, 7-308, 1-56 illus., 7-91 illus.

Krupp [kroop], **Alfred** (1812-87). Ger. "cannon king," discoverer of method of casting steel in large pieces; made great guns used (1870-71) in the siege of Paris; also "Big Bertha" of 1st World War.

Krupp, Friedrich (1787-1826). Ger. ironmaster, founder of house of Krupp and of great Krupp works at Essen; introduced manufacture of cast steel into Ger.; died in poverty.

Krupp, Friedrich Alfred (1854-1902). Son of Alfred, grandson of Friedrich, left Krupps to daughter Bertha.

Krupp von Bohlen and Halbach, **Bertha** (b. 1886). Eldest daughter of Friedrich Alfred; inherited Krupps at 16.

Krupp von Bohlen U. H., **Gustav** (1871-1950). Head of Krupps with son Alfred (b. 1907), in 2nd World War. (Gustav Krupp, indicted for war crimes in 1945, was found unfit in health to stand trial; Alfred Krupp, found guilty at Nuremberg of war crimes, July 1948, was sentenced to 12 yrs. imprisonment with forfeiture of all property; released 1951 and some of his property returned.)

Krupp Steel Works bombed by Allies 1941-45; dismantled 1946-47; 3-296.

Krypton (Kr). A rare gaseous element of inert gas group; atomic no. 36; atomic weight 83.7; composed of several isotopes; found in air in minute quantities by Ramsay and Travers, 6-363, 1-80, 81; liquefied at -118° F.; name is Greek for "hidden"; 3-221.

Kshatriyas. Hindu warrior caste, 1-262, 4-178, 4-242.

Kuala Lumpur. Tn., seat of govt. of the Federation of Malaya; pop. 145,800; 5-93.

Kuang. For Chinese names beginning thus see *Kwang*.

Kuban' River, 500 m. long, flows across w. half of N. Caucasus.

KUBELIK

Kubelik [koo'bēlik], Jan (1880-1940). Bohemian violinist; acquired extraordinary technique at early age and for a decade was the most popular concert virtuoso.

Kublai Khan [koo'bli kahn] (1216-94). One of the greatest, most intelligent, and most cultured of Mongol rulers, grandson of Jenghiz Khan; completed conquest of China; 5-237, 238 illus.; and Marco Polo, 6-256; and Peking, 6-108.

Kuching. Cap. of Brit. Crown Colony of Sarawak, pop. 35,480; 6-498.

Kudu, or Koodoo. Species of large antelope native to Africa from Abyssinia southward. Height up to 4 ft. at shoulder. Greyish or reddish brown with vertical white stripes. Long twisted horns.

Kuenlun [kwen'lun] Mts. In cent. Asia on N. border of Tibet; highest peak estimated 20,000 ft.; 1-264.

Kufra. Group of 5 oases in Sahara, N. of Tropic of Cancer; tn. of Kufra on caravan route; 6-485.

Kuibishev, formerly Samara. City of the U.S.S.R., 525 m. S.E. of Moscow on r. Volga; pop. (1939) 390,000; artificial lake, 4-220.

Kuka [koo'ka]. Tn. in N.E. corner of Nigeria, Africa; est. pop. 60,000; slave mart previous to 1894.

Ku Klux Klan. Secret society in U.S.A., founded at close of Amer. Civil War to counteract influence of dishonest politicians; originated in Tennessee in 1865, other branches formed, and in 1871 72 laws were passed for their suppression. In 1915 the name was revived for a society admitting only native-born, white, Protestant, American citizens; founded in Georgia, it spread to other states, northern as well as southern.

Kukri, curved knife used by Gurkhas 4-108 with illus.

Kulak. Small farmer or landowner in Soviet Russia.

Kulikor. Tn. on r. Niger in Fr. Sudan; pop. about 6,000; railway to Dakar 5-134.

Kum. Persian oasis town; 80 m. S.W. Teheran; sacred place of Shiah Mahomedans; pop. 30,000.

Kumasi [koomah'sē]. Cap. of Ashanti, Brit. W. Africa; pop. 70,700; exports cocoa, rubber, cattle, and other products; captured by Brit. in 1874, 1896, and 1900; chief distributing centre for Ashanti.

Kummel. A liqueur, so named because

cummin seeds (similar to caraway) are used as flavouring.

Kunersdorf [koo'nerzdorf]. VII. in Prussia, 4 m. N.E. of Frankfurt-on-the-Oder; Prussians defeated by Russians and Austrians 1759 (Seven Years' War), 7-2.

Kunlun Mountains. See Kuenlun.

Kunzite [koon'ts'i]. A semi-precious stone found in Madagascar and California; phosphorescent after exposure to radium.

Kuomintang [kwawmintang']. The National People's Party of China, founded in 1923 by Sun-Yat Sen, aiming at independent China and social reforms; 2-375, 2-333.

Kur. Principal r. of Transcaucasia, flowing S.W. 820 m.; navigable for 350 m. from mouth.

Kurdistan. Mountainous country in E. of Asia Minor and extending into Persia; peopled by the Kurds.

Kurds. Mahomedan tribes of Asia Minor, descended from the Carduchi; they number about 2,500,000.

Kurē [koo'rā]. Japan. Important naval port on Honshu Isl. and Inland Sea; pop. 231,000.

Kuria Muria [koo'ria mō'ria] Islands. Group of 5 isls. off S. coast of Arabia; 28 sq. m.; part of Brit. colony of Aden; cable station; 1-19.

Kurile [koo'ri] or Chishima Islands. Group of volcanic isls., stretching N.E. from Hokkaido, Japan; 3,969 sq. m.; name comes from Russian kurlit ("to smoke") in allusion to active volcanoes; transferred to U.S.S.R. in 1945; 4-310.

Kurnool. Provisional cap. of state of Andhra (q.v.) Rep. of India.

Kuskokum River, Alaska. Rises in Alaskan Range and flows 700 m. to Bering Sea. Navigable 500 m. from mouth, 1-89.

Kutb Minar. Anc. tower 10 m. from Delhi, 238 ft., 3-68 with illus.

Kutch (India). See Cutch.

Kut-el-Amara [koot-laugh'ā]. Iraq. Tn. on r. Tigris, 105 m. S.E. of Baghdad; rly. terminus; strategic point in 1st World War; Brit. force under Townshend surrendered to Turks (1916) after long siege; re-captured by British, 1917; 7-480.

Kuwait. Arab state and spt. on N.W. coast of Persian Gulf. Area of state approx 2,000 sq. m.; pop. 165,000. Mostly desert. Has immense oil reserves, 1-191; pipelines, 6-152 illus. f., 6-135 illus.

LABUAN

Kwangchow. See Canton.

Kwangsi. Inland prov. of S. China; 83,000 sq. m.; pop. 14,861,500; cap. Yunnaning; commercial centre Wuchow; cotton, grain, metals, gems.

Kwang-Su or Kuang-Hsu. Title assumed by Tsai T'ien (1872-1908), emperor of China; during his reign occurred the war with Japan, the Boxer rebellion and the occupation of Peking by the Western Powers; under domination of the Empress Dowager, Tzoe-Hsi.

Kwangtung or Kwantung. Prov. of S.E. China; 85,417 sq. m.; pop. 32,338,800; minerals (gold, coal, and iron); silk exports; cap. Kwangchow; chief cities, Hong Kong, Macao, Canton.

Kwanon Tunnel. Rly. tunnel under Shimonoeki Straits, Jap.; linking pt. of Shimonoeki, Honshu Isl., with Moit on Kyushu; 1½ m. under water; completed in 1941.

Kweichow [kwā'chow]. Prov. of S.W. China; 69,000 sq. m.; pop. 10,557,400; cap. Kwelyang; gold, silver, mercury, tin, coal and iron.

Kyat. See Money (Hst.).

Kyd, Thomas (c. 1558-91). Eng. dramatist, one of most important predecessors of Shakespeare (*The Spanish Tragedy*); 3-118.

Kyles of Bute. Narrow winding channel separating the island of Bute from the mainland of Argyllshire, Scot., 2-426, 2-134 illus.

Kyloe Cattle. See Highland Cattle.

Kyoto. Former cap. of Japan; pop. 1,204,017; 4-426, 7-289; centre of Buddhist faith, 4-342; Yasaka Pagoda, 4-345 illus.






Kyrie Eleison [kirī'elā'son]. Ok. words, meaning "Lord have mercy," used as form of prayer in both Ek. and Rom. Cath. Churches, and also (translated) in Anglican Church.

Kyrie [kēri], John (1637-1721). Edg. philanthropist, known as "the Man of Ross"; his family had lived long at Ross, Herefordshire, and he did everything he could to benefit the tn.; his memory perpetuated in the Kyrie Society.

Kyushu or Kiushu [kūshoo']. Southernmost of 4 large isls. forming Japan proper; 16,000 sq. m.; pop. approx. 10,200,000; mountainous and volcanic; 4-310; map, 4-311.

Kzhil Kiya. Tn. Kirghiz S.S.R., 4-414.

L

THE letter L is thought to be descended from the ancient Egyptian hieroglyph representing a lioness  which became the symbol  or  when written in a running hand. Here some resemblance to our letter is already visible. The Phoenicians wrote it like this:  and called it *lamad*, "ox-goad," from its resemblance to that object. The Greeks called it *lambda* and turned it about so that it looked like our V upside-down, .

The Romans straightened it out to the form it has to-day. The sounds *l* and *r*, known as the liquids, are very closely related. In fact, scholars tell us that in Egyptian, as in some other languages, no clear distinction was made between them, the signs for these sounds being used interchangeably. There are peoples, e.g. the Chinese, who cannot sound the *r*, and these substitute *l* for *r* (*velly* for *very*). This use of *l* for *r* is known as "lambdacism."

Laaland [law'land]. Danish isl. in Baltic sea; 445 sq. m.; pop. 86,000; forests of oak and beech; crops incl. wheat, hops, hemp, apples.

La'ban. Father-in-law of Jacob, who served him 7 years for his daughter Rachel (Gen. xxviii-xxxi).

La Bassée [labassē]. Tn. of Fr. in dept. of Nord; scene of fierce battle fought between British and Germans in 1914.

Lab'danum. Gummy secretion of leaves of several plants of rock rose family, used as fixative for perfumes.

Labe (riv.). See Elbe.

Labiateae [lābiā'tē]. Plant family including dead-nettles, mint, catmint, and ground-ivy, 7-272.

Laboratory, of alchemist, 1-95 illus.; Priestley's laboratory, 2-316.

Labouchère [laboocher'], Henry Dupré (1831-1912). Brit. journalist and radical politician; founder and editor of the weekly *Truth*, noted for exposure of public frauds.

Labour. In economics, 3-159.

Labour, Ministry of. Brit. government dept. Established 1916 to deal with national business affecting employment of labour. During 2nd World War took over organization of manpower, changing name to Min. of Labour and National Service.

Labour Party. Brit. political party, 4-427; nationalisation, 7-81; Ramsay MacDonald, 5-61.

Labrador. Most easterly part of Brit. N. Amer., part of prov. of Newfoundland, Canada; area 110,000 sq. m.; pop. 5,528; 4-427, 5-395; Gronfell's work in, 4-06.

Labrador Current. Atlantic ocean; iceberg in, 1-293.

Labrador Retriever. Sporting dog; retrieved game. Height 23 in. at shoulder. Sturdy, smooth-coated. Black, golden or brown, 3-101 illus. f.

Labradorite, variety of feldspar, used in building, 3-345.

La Bruyère [la brooyār'], Jean de (1645-96). Fr. essayist, one of best writers of classical French, 3-455.

Labuan. Isl. of S.W. coast of Borneo, part of colony of Brit. N. Borneo;

LABURNUM

area 35 sq. m.; pop. 8,754; cap. Victoria; Brooke governor, 6-499.

Laburnum. A small tree, fam. *Leguminosae*, native to cent. and s. Europe; cultivated for showy yellow flowers and glossy foliage; all parts poisonous; wood extremely heavy.

Labyrinth. Name given by Greeks and Romans to buildings, entirely or partly underground, with intricate winding passages in which one easily became lost; in Crete, 2-25.

Labyrinth. In anatomy, the internal ear; cochlea, balancer mechanism, and vestibule, 3-147.

Lac. Sap of the varnish tree, used in lacquer work, 4-434, 6-389.

Laceseive (lak'adv). Islands. A group of 14 coral isls. 200 m. w. of S. India in Indian Ocean; attached to Madras state; pop. 18,300; coconut plantations; 6-49.

Lace. 4-429.

Lacertila. The lizard order of reptiles, 4-528.

Lace-wing Fly. Insect of the order *Neuroptera*, distinguished by its lace-like wings and most brilliant eyes; common Brit. species is bright pale green in colour; apr. 3-171 illus.

La Chaux-de-Fonds (la shô de fon). Tn. in Switz.; watchmaking centre; pop. 33,300; 4-387.

Lachesis (lak'esis). In classical myth., one of the Fates, the goddesses who were supposed to control human destinies, 3-343.

Lachish (lak'ish). Anc. city in s. Palestine, often mentioned in Tel-el-Amarna tablets and in Bible; destroyed by Joshua (Joshua x. 31-3) and assigned to tribe of Judah (xv. 39). Excavations by Petrie (1890), Bliss (1891-93), Wellcome-Marston expedition (1933-39).

Lachlan River. N.S.W., Australia, 850 m. long; tributary of the Murrumbidgee, 5-402, 1-316.

Lackey Moth. Moth of family *Lasiocampidae* whose larvae form large colonies in tent-like masses of web on hawthorn and similar hedges; larvae striped red, black, blue, yellow (hence name, lackey); adult, dull brown. Eggs are laid in masses round twigs of trees, especially apple trees, where caterpillars if not destroyed are liable to become a pest.

"Lackland." Nickname given to John John of Eng., 4-378.

Lacock. Village of Wilt., Eng., noted for picturesque beauty, 5-330 illus.; Lacock Abbey and copy of Magna Carta, 5-81.

La Condamine. Small tn. in principality of Monaco, 5-250.

Laconia. District of Greece of which Sparta was the capital, 7-124.

Lacoste (Jean) René (b. 1905). Fr. lawn-tennis player; first became singles champion of Fr. 1925, and won at Wimbledon twice, in 1925 and 1928; perhaps the greatest player of France's "Four Musketeers"; 4-462.

Lacquer and Shellac. 4-434; Jap. lacquer work, 4-342, 4-353.

Lacrima Christi. Wine produced in vineyards on mt. Veuvius, 6-317.

Lacrosse. Game, 4-435, 6-374.

Lace. Small scale insects which secrete shellac, 4-434.

Lactarius Pergamenus (fungus). See *Perichthium Lactarius*.

Lactic Acid. Organic acid in sour milk; atomic arrangement, 1-12; produced by enzymes, 3-346.

Lactometer. Instrument for measuring the specific gravity of milk, 4-222.

Lactose (milk sugar), 7-186, 5-205.

Ladd, George Trumbull (1812-1921). Amer. philosopher, 6-160.

Ladders. Armenia, 3-361.

Ladislavus (lad'islaw) I, St. (1040-95). King of Hungary (1077-95) and founder of national greatness; established Christianity and subdued heathen; most beloved of Hungarian kings.

Ladoga (lah'doga). Largest lake of Europe, in N.W. Rus., 7,000 sq. m.; discharges into Gulf of Finland by r. Neva; icebound about half the

year; centre of fierce fighting 1939-40 in Russo-Finnish war, following which land n. and w. of lake was ceded to Russia; 6-479.

Ladrones (Pacific Isl. group). See *Marianas*.

Ladybird. A small spotted beetle, 4-436, 1-414; stages in life of, 4-267 illus.

Ladybug. See *Ladybird*.

Ladycow. See *Ladybird*.

Lady Day. Feast of the Annunciation of the Virgin Mary, March 25; in England, a quarter day.

Lady Margaret Hall. Coll. for women, Oxford Univ., 6-18.

Lady of the Lake. In Arthurian legend water fairy who reared Lancelot.

"Lady of the Lamp, The." Name given to Florence Nightingale, 5-438.

Ladysmith. S. Africa, trade centre and rly. junction in N. Natal; pop. 9,700; besieged by Boers for 118 days (1898-1900) during Boer War; Roberts raises siege, 1-502, 503 illus.

Lady's Slipper. Flower, 4-436.

Lady's Smock. Flower, 2-24 illus. f.

Lady Sylvia. Variety of rose, 6-452 illus. f.

Laemmle, Carl (1867-1939). Amer. film director, 2-396.

Laennec, René Théophile Hyacinthe (1781-1826). Fr. physician, inventor of the stethoscope, 6-162.

Laevulose (læ'vulôz). Another name for fructose or fruit sugar, referring to the fact that this form of sugar rotates polarized light to the left (Lat. *laevus*, left); polarisation of light, 4-501; in Jerusalem artichoke, 1-257; in honey, 4-30.

Lafayette, Marie Joseph Paul Roch Gilbert du Motier, Marquis de (1757-1834). Fr. general and patriot, 4-436; and Amer. independence, 1-139.

La Fontaine, Jean de (1621-95). Fr. author of fables, 4-437, 3-455; Racine and, 6-334.

Lagan (lag'an), r. of Northern Ire.; flowing 35 m. to Belfast Lough, 1-178, 1-416.

Lagan (local term). See *Flotsam*.

Lagash. Anc. city-kingdom in Babylonia, one of oldest centres of Sumerian civilization.

Lager. Light beer of s. German origin. In mfr. fermentation is incomplete and carbonic acid gas is formed imparting a sweet taste.

Lagerlöf, Selma Ottilliana Louisa (1858-1940). Swed. novelist whose stories are rich in folk-lore and legends. Wrote book for children, *The Wonderful Adventures of Nils* (1907). Nearly all her works have been translated into English.

Laggan, Loch. Fresh-water loch, Inverness-shire, Scot., 4-275.

Lagging. of waterpipes, 1-203.

Lagoon Islands. See *Ellice Islands*.

Lagos. Chief tn. and apt. of Nigeria, W. Africa; pop. 267,500; 7-440, 5-435.

Lagrange (lag'rahnz'), Joseph Louis (1746-1813). Fr. mathematician; one of greatest of 18th cent.; contributed to verification of Newtonian theory.

La Guardia (lah gwah'dia), Fiorello H. (1882-1947). Amer. politician; mayor of New York City 1933, 1937, 1941; put an end to "boss" control in city govt.; director-gen. of U.N.R.R.A. during 1946.

La Haye Sainte. A keypoint of the British front at Waterloo, 7-428.

Lahn. Tributary of r. Rhine, about 140 m. long, 6-390.

La Hogue (lah hóg) or **La Hougue**. Battle of. Fought in 1692 near N.E. extremity of peninsula of Cotentin, Normandy, Fr.; Eng. and Dutch fleets under Admiral Russell defeated Fr. fleet under Tourville, 3-281, 4-340.

Lahore (lahawr'), Pakistan. Anc. walled city on r. Ravi, largest city and cap. of Punjab; pop. 1,000,000; rly. centre; makes silk and cotton cloths, carpets, vegetable oils. Punjab Univ.; 6-39, 44; 6-310.

Lalbach (lil'bahkh). See *Ljubljana*.

LAMBDAICISM

L'Aiglon (lâ'gion'). Poetic name meaning "eaglet" given by Victor Hugo to Duke of Reichstadt, son of Napoleon I and Marie Louise.

Lalage's Nek. See *Lang's Nek*.

Lalme-faire (lâ'sâfâr') ("let it be"). The 18th cent. (Fr.) way of saying "less government in business"; in modern use means unrestricted industrial and commercial competition.

Lality. Word generally used to distinguish the people from the clergy; a layman is one who does not belong to a profession or is not an expert.

Laïus. In Gk. myth., father of Oedipus and king of Thebes; killed by Oedipus.

Lake, Simon (1866-1945). Amer. naval architect who invented a submarine for salvage work, 7-174.

Lake. Pigment; origin of name 4-435.

Lake. Enclosed body of water, 4-438.

WORLD'S GREATEST LAKES

NAME	APPROX. AREA IN SQ. M.
Caspian	170,000
Superior	31,820
Victoria	24,500
Aral Sea	26,000
Huron	23,010
Michigan	22,400
Nyasa	14,200
Baltic	13,350
Tanganyika	13,000
Erie	10,000

Lake District. Region of N.W. Eng. containing principal lakes, 4-438 with map; hill farms, 3-255 illus.; the "Lake" poets, 3-219; storms 4-506; volcanic rocks, 2-88; West water, 3-250 illus.

Lake-Dwellings. 4-439; reconstruction of, 5-103 illus. f.; of Neolithic Age, 5-109.

Lakeland Terrier. See *Dogs* (list).

Lake of the Woods. Between U.S.A. and Ontario, Canada, area 1,350 sq. m.; length 70 m., 2-195.

Lake Poets. A group of poets—Coleridge, Wordsworth, and Southey—who lived in the Lake District of N.W. England; De Quincey and, 3-75.

Lakh or Lac. Hindu word for 100,000 chiefly used for 100,000 rupees.

Lalique (lalôk), René (1860-1945). Fr. designer specialising in glassware used delicate colours, and designs of birds, deer, fish, flowers, etc.

Lalo (Victor Antoine) Édouard (1823-92). Fr. composer, 5-315.

Lama. Buddhist monk, 7-273, 272 illus. f.

Lamalism. Form of Buddhism in Tibet and Mongolia, 2-108, 7-273.

Lamarck (lamahrk'), Jean de (1744-1829). Fr. naturalist, who suggested (in 1801) the word "biologie" as name of new science to be devoted to study of all life considered as the same process whether in plants or animals; forerunner of Darwin 3-52, 3-321, 4-168, 7-526.

Lamarckian theory of evolution. 3-324

Lamartine (lamahr'tên'), Alphonse de (1790-1869). Fr. poet, historian, statesman; unsuccessfully contested presidency in 1831 (*Meditations; History of the Girondins*).

3-456; in 1848 Revolution, 3-453

Lamb, Charles (1775-1834). Brit. essayist, 4-440; *Essays of Elia* 3-290; *Tales from Shakespeare* 2-337; *Dissertation on Roast Pig* 2-495; and Hood, 4-191.

Lamb, Mary (1764-1847).? Sister of Charles Lamb, 4-441.

Lamb Isl. off coast of N. Lothian, Scot., 6-40.

Lamb, Meat. joints of, 5-153.

Lamballe (lombal'), Marie Thérèse de (1749-92). Fr. princess, friend of Marie Antoinette; killed by revolutionary mob and her head carried past the queen's prison windows.

Lambarene. Mission station in Fr. colony of Gabun; Schweitzer's hospital at, 6-508.

Lambda. λ, a (Rom. I, L); Eleventh letter of Gk. alphabet.

Lambdaic. In speech the use of l for r (from Greek letter *lumbda*, l).

LAMBERT

Lambert, Constant (1905-51). Brit. composer, conductor, and critic. Compositions include *Romeo and Juliet*, *Horoscope* (ballet), *Rio Grande*, for chorus, pianoforte and orchestra; musical director of Vic-Wells ballet 1933-47.

Lambert, John (1619-94). English general, who fought under Cromwell; distinguished himself at Marston Moor, Dunbar, and Worcester.

Lambert. Unit of brightness. It is a surface the brightness of which is independent of the direction from which it is observed. One lambert is the brightness of such a surface emitting or reflecting one lumen (g.v.) per sq. cm.

Lambeth. Met. bor. of London; pop. 230,103; pottery mfrs.; Lambeth Palace is London residence of Archbishop of Canterbury; 5-27.

Lambeth Conference. A meeting of bishops of the Anglican church throughout the world which takes place once in ten years at Lambeth Palace, London; first held in 1867.

Lamellibranchia. Class of molluscs, including oysters and cockles, 5-232.

Lamentations. Book of Old Testament, traditionally ascribed to Jeremiah, bewailing destruction of Jerusalem.

Lamia (lā'miə). In Gk. myth., a beautiful vampire; in Keats's poem "Lamia".

Laminated Glass, 4-32.

Lamlash Bay, Arran Island, Buteshire, Scot.; natural harbour; in 1st World War, 2-134.

Lammas. Festival of the wheat harvest observed in Eng. church, Aug. 1; a quarter day in Scotland, Aug. 12.

Lammergerlei (lām'gər'lei). A member of the vulture family, also called bearded vulture from tuft of bristles at base of beak, 7-407.

Lammermuir Hills. Scot., range of hills in Berwickshire and E. Lothian; highest summit, Lammer Law, 1,723 ft., 5-39, 6-510.

Lamp-black. Pigment obtained from soot deposited during the burning of mineral oil, turpentine, gas, etc., in a limited supply of air. Used in mfr. of paints etc., 2-219.

Lampedusa. It. isl. in Mediterranean. Largest of the Pelagian group, 30 m. w. of Malta; area 84 sq. m.; pop. 3,590. Chief products are wine, corn, vegetables.

Lampfern. See Lamprey.

Lampeter. Tn. in Cardiganshire, Wales; pop. 1,800; St. David's College (theological); 2-221.

Lampman, Archibald (1861-99). Canadian writer, 2-203.

Lamprey, 4-441; as a fish parasite, 6-78.

Lamps, 4-442; acetylene, 1-9; types of electric lamp, 3-220; infra-red lamps, 4-261; pressure lamp, 1-493 illus.; safety lamp, 3-53, 54 illus.

Lamp Shell. Creature resembling a mollusc, but also surviving representative of phylum *Brachiopoda*; similar forms are among the oldest of fossils.

Lamy (lā'mé), Claude Auguste (1829-78). Fr. glass-maker; discovered thallium (1862); produced a dense thallium glass (1867).

Lang, Francesco de (1631-87). Italian scientist and Jesuit priest; balloon theories, 1-353.

Lanal. One of the Hawaiian Isls., area 141 sq. m.; pop. 3,136; sugar and pineapples, 4-139.

Langark, Scot. Co. tn. of Lanarkshire; weaving, cattle and sheep trade; pop. 6,319; 4-444.

Lanarkshire. Co. of Scot.; area 879 sq. m.; pop. 1,614,126; co. tn. Lanark; 4-444.

Lancashire. Co. of Eng.; area 1,875 sq. m.; pop. 5,116,013; co. tn. Lancaster; 4-444; cotton industry, 2-518, 520, 3-249.

Lancaster, John of Gaunt, Duke of. See John of Gaunt.

Lancaster, Joseph (1788-1838). Brit. educationist; started a school for poor children in South London,

where he set the elder pupils to teach the younger; it finally developed into the Royal Lancasterian Society. **Lancaster**. City and co. tn. of Lancashire, on r. Lune, 7 m. from sea; pop. 51,650; mfrs. linen, cotton goods, furniture; was anc. Rom. station; castle (oldest part c. 1170); 4-444.

Lancaster. The chief type of heavy bomber aircraft of Second World War, designed for the R.A.F. by A. V. Roe & Co.; converted into civil airliner Lancaster after war.

Lancaster, House of. Famous Eng. royal family, descended from Edmund, son of Henry III, who was created first earl in 1267; the Wars of the Roses saw the fall of the great house; 4-162, 6-453 54.

Lance-corporal. Lowest non-commissioned rank in Brit. army; artillery equivalent, lance-bombardier.

Lancelet. Amphioxus, sand-burrowing, marine animal classed as a very primitive vertebrate in group *Cephalochorda*.

Lancelot, or Launcelot, of the Lake. In Arthurian legend, the most famous and bravest of the Knights of the Round Table; and Guinevere, 6-458, 1-256; and the Lily Maid, 6-458.

Lanceolate. Bot. term given to a type of leaf blade, 4-471.

Lancer. Mounted soldier armed with a lance. Lancer regiments introduced into Brit. army in 1816. Lance was 9 ft. 1 in. long with small pennant. Weapon abolished 1927; regiments are now mechanised; Brit. uniform (1890), 1-249 illus.

Lanchester, Frederick William (1868-1946). Brit. engineer and pioneer motor-car designer.

Lancing College. In the vil. of Lancing in Sussex; is the senior of the schools founded in 1848 by the Rev. N. Woodard; chapel is well-known landmark.

Lancret, Nicolas (1660-1743). Fr. painter, imitator of Watteau, 3-439.

Land, in economics, 3-139; on earth's surface, 3-150; and food supply, 3-111; destruction and formation, 3-516; inheritance of land in France, 3-434.

Land Crabs, 2 523, 524.

Länder (singular, *Lant*). Semi-sovereign states of W Germany, 4-3.

Landes (lā'nd). Region of s.w. Fr., vast tract of sandy marshland bordered by dunes; reclamation, 3-434, 6-496.

Land or Square Measure, units of. See Weights and Measures.

Land of Hope and Glory. Brit. patriotic song, 3 228.

Land of the Midnight Sun (Norway).

Land of the Rising Sun (Japan).

Landon, Walter Savage (1775-1805). Brit. poet and prose writer. His greatest achievement is his *Imaginary Conversations*, containing dialogues put into the mouths of famous people in history.

Landport. Suburb of Portsmouth, Hants, 6-266.

Land-rail, or Corncrake. Bird, 6-353 with illus.; egg, 1-452 illus. f.

Landscape Gardening. "Capability" Brown and, 2-94.

Landscape Painting, Dutch and Eng. as pioneers, 6-31; Eng. school of, 3-260 with illus.; C. notable realism and European influence, 2-487-88 with illus.; Impressionist style in, 4-236-37 with illus.; Turner's mastery in, 7-337-38 with illus.

Landscape, Sir Edwin (1802-73). Brit. painter and sculptor; Lions in Trafalgar Sq. 5-31 illus.; Albert and Queen Victoria, 1-93 illus.; Dignity and Impudence, 3-261, 263 illus.

Land's End. Promontory of Cornwall, westernmost point of England, 2-85.

Land Speed Record. 394.2 m.p.h., by J. R. Cobb, 1947.

Landssteiner, Karl (1868-1943). Austro-Amer. pathologist; did research on infantile paralysis and haemoglobinuria; his discovery of the

LANGUE D'OIL

human blood groups invaluable to blood transfusion methods in both World Wars. Nobel prize for medicine in 1930.

Lang, Sir William Arbuthnot, Bart. (1856-1943). Brit. surgeon; founder of the New Health Society (1925); 7-195.

Lang's Prince Albert, cooking app. 6. 1-186 illus. f.

Lang's (c. 1003 89). Eng. prelate and scholar, b. in Italy, Archbishop of Canterbury (1070-89); as chief counsellor of William the Conqueror, whom he accompanied to England, played important part in imposing Norman rule upon Eng. Church and people; rebuilt Canterbury Cath.

Lang, Andrew (1844-1912). Brit. scholar, poet, and writer on many subjects; a graceful essayist, and vivid historian; collected many charming fairy tales (*Ballads in Blue China*; *Custom and Myth*; *History of Scotland*), 1-484.

Lang, Cosmo Gordon, Baron (1864-1945). 95th Archbishop of Canterbury 1928-42; Bishop of Stepney (1901-08); Archbp. of York (1908-28); crowned King George VI. created Baron Lang of Lambeth, 1912.

Lang (Alexander) Matheson (1879-1948). Brit. actor of Canadian birth; played Shakespearean rôles and was the original Mr. Wu and the Wandering Jew in the plays of those names.

Langdale Pikes. Mts. in Lake dist. Eng., 2,403 and 2,323 ft., 4-438.

Langenhoven, C. J. (1873-1932). S. African writer; and Afrikaans language, 7-94, 1-86.

Langerhans, Islands of. Certain cells in the pancreas which produce the hormone insulin 4-270, 4-28.

Langvin (lā'njvān), Paul (1872-1946). Fr. physicist; worked with Pierre and Marie Curie; at Cavendish Lab., Cambridge, discovered secondary rays of X-rays; a pioneer in the electron theory of magnetism and in other branches of theoretical physics.

Langfjellene Range. Mts. in S. Norway, 5-462.

Langland, William (c. 1330-1400). Eng. poet, author of *Vision of Piers Plowman*, a religious allegory attacking corruption in Church and state; 3-284.

Langley, Samuel Pierpont (1834-1906). Amer. astronomer and physicist; inventor of an early heavier-than-air flying machine, 1-38.

Langmuir, Irving (b. 1881). Amer. chemist, inventor of gas-filled tungsten elec. lamp, researched on electrons and on heavy hydrogen; Nobel prize for chemistry 1932.

Langobards ("long boards"). See Lombards.

Lang's Nek. Scene in 1881 of a Boer victory over Brit. force commanded by Sir G. Colley, an engagement that preceded the battle of Majuba; it is a pass of the Drakensberg range in Nat. l. less correctly called Laings's Nek.

Langton, Stephen (c. 1150-1228). Eng. cardinal and Archbishop of Canterbury, usually credited with being the first to divide the Bible into chapters; and King John, 4-378.

Langtry, Lily (Emily) (1852-1920). Brit. actress, noted for her beauty, b. in Jersey and known as the "Jersey Lily"; became Lady de Batho.

Language and Literature, 4-445; aff. language and archaeology, 1-204; Aryan group, 1-261; and Babel legends, 1-335; Esperanto and artificial languages, 3-296; most-used letters, 2-444; Norwegian, 5-465; philology, 6-158; Red Indian languages, 6-372 illus.; Romance languages, 6-427; Scottish dialect, 6-613; slang, 7-61; why artificial languages have no literature, 4-445; ballads, 1-350; writing of history, 4-180, 181; mythology and, 5-312; novel, 5-470; poetry, 6-233.

Langue d'Oc. Dialect of S. France, 2-453.

Langue d'Oïl. Dialect of N. France, 2-453.

Langur. See Hanuman Monkey.
"Lanital." A fibre resembling wool made from cactin, 6-369.
Lankaster, Sir Edwin Ray (1847-1929). Brit. biologist, widely known for his delightfully entertaining writings; pres. of Brit. Association (1906); founder of Marine Biological Association. (*Science from an Easy Chair; Extinct Animals*).
Lanolin. Fat extracted from sheep's wool. White or yellowish white. Has antiseptic properties and forms the basis of some ointments and cosmetic creams.
Lansbury, George (1859-1940). Brit. socialist, politician, and journalist; M.P. 1910-12 and from 1922; editor *Daily Herald* 1914-22; first comm. of works 1929-31; inaugurated "Lansbury Lido" on the Serpentine, Hyde Park; leader of the Labour party 1931-35; dist. of Poplar, London, rebuilt early 1950s, called after him.
Lansdowne, Henry Petty-Fitzmaurice, 3rd Marquess of (1780-1883). Brit. statesman, chancellor of the exchequer at 25, a Liberal leader and advocate of parliamentary reform, abolition of slavery, Free Trade, and Cath. emancipation.
Lansdowne, Henry Petty-Fitzmaurice, 5th Marquess of (1815-1927). Brit. statesman, gov.-gen. of Canada (1883-88); Viceroy of India (1888-93); advocate of peace with Germany by negotiation in 1917.
Lansing, Michigan, U.S.A. * Cap., on r. Grand, 80 m. n.w. of Detroit; pop. 91,894; motor-cars, agricultural machinery, 6-192.
Lantern. In architecture, a small tower on the roof of a building, admitting light and air.
Lantern, of lighthouse, 4-592 with illus.
Lantern, Magic. A lamp and lens system for projecting transparent pictures on a screen for the benefit of large audiences.
Lantern Clock, 2-413, 414 with illus.
Lanthanides. See Rare Earths.
Lanthanum (La). Chem. element; atomic no. 57; atomic weight 138.92; 3-224.
Lanthorn. Kind of lantern; horn used in, 4-443.
Lanugo. Hair which covers the entire body, 4-117.
Lanuvium (lan'vium) (modern Civita Lavinia). Anc. city of Latium, 19 m. s.e. of Rome; member of Latin League; conquered by Rome 338 B.C.
Laocoon. In Gk. myth., a Trojan priest who warned the Trojans of the Gk. stratagem of the wooden horse, 7-320, 319 illus.
Laodicea (laodice'a), or Laodicea ad Lycum. Anc. city (modern Latakia, q.v.), wealthy trade centre, 120 m. s.e. of Smyrna (Izmir), one of 7 primitive churches of Asia; Synod of Laodicea in 4th cent. decided religious questions.
Laoghla (Irish Rep.). See Leix.
Laomedon (laom'edon). In Gk. myth., founder and king of Troy; father of Priam.
Leon (lon'). City in Fr., 80 m. n.e. of Paris; pop. 17,100; fortified by Romans; scene of French defeat 1814, 1815, 1870.
Laos. Kingdom in Indo-China, an associate state of the Fr. Union; area 100,000 sq. m.; pop. 1,500,000; 4-445, 4-256, 1-274; map, 4-257.
Lao-tse (lowdzé) (b. c. 570 B.C.). Chinese philosopher, founder of Taoism; 2-366; it is recorded that he interviewed Confucius in 517 B.C., but death date is unknown.
La Paz (lah pahz'). Largest city and seat of govt. of Bolivia, S. Amer.; pop. 321,063; commercial centre of agricultural and mining region; univ.; 1-507 with illus.
La Paz. Spt. on w. coast of Mexico; chief industry pearl fishing; 5-186.
Lapidary. One who works or deals in gem-stones, 7-165.
Lapis lazuli. Mineral of the feldspar group; ultramarine from, 6-38.
Lapithae. Legendary people in Gk.

myth.; and Centaurs, 2-291 and Thesens, 7-269.
Laplace (laplas'). Pierre Simon, Marquis de (1749-1827). Fr. mathematician and astronomer, called "Newton of France"; proved stability of solar system; formulated the nebular hypothesis, 6-213.
Lapland. Undefined dist. in n.w. of Europe, extending from the White Sea to the Atlantic coast of N. Scandinavia, 4-446.
La Plata (lah plab'tal). Argentina. City 35 m. s.e. of Buenos Aires, 5 m. from port of Ensenada on La Plata estuary; pop. 217,738; 1-223.
Lappet Moth. Moth of the silkworm family, so named because larvae have lobes or lappets at sides of bodies, 4-265 illus.
Lapps. People of Asiatic origin living in n.w. of Europe, 4-446, 7-201; in Norway, 5-461; reindeer, 1-221.
Lapstone. In shoemaking, 2-14.
Lapwing. Bird of the plover family, 6-226, 227 illus.; migration, 6-204 illus. f.
Lapworth, Lake. Great lake formed by the dammed waters of r. Severn during the Ice Age, 7-4.
Leaboard. Obsolete term for the port, or left-hand, side of a ship looking forward. Abolished because of confusion with starboard.
Larsh. Deciduous tree *Lorix decidua*, family *Coniferae*, 4-447, 3-421, 2-484; aphid pest, 1-183; cone of, 2-483 illus.; 7-314 illus.
Lares et Penates. In Rom. myth., private household or family gods, whose images were kept on the hearth or in a special chapel.
Large Blue Butterfly, 2-140, illus.; caterpillar as an "ant-guest," 1-163.
Large Copper, extinct butterfly, 2-141 illus.
Large Emerald moth, 2-141 illus.
Large Heath Butterfly, 2-141 illus.
Large Skipper Butterfly, 2-141 illus.
Large Tortoiseshell Butterfly, 2-140 illus.
Large White. Breed of pig; bacon, 1-342.
Large White Butterfly, 2-139 illus.
Largillière, Nicolas (1656-1716). Fr. painter; Louis XIV and family, 6-12 illus.
Largo. In music, 5-305.
Largo. Seaside resort of Ayrshire, Scot., on Firth of Clyde; yachting centre; pop. 8,600; scene of battle (1263) between Norse and Scots, 7-270.
Laridae. Bird family including terns and gulls, 7-260.
Larissa (laris'al). Greece. City in Thessaly on r. Salammbria; pop. 23,900; transit trade, textile mfrs.; important city in anc. times.
Lark. Bird, 4-447.
Larkspur. Flower, 4-448; as poisonous plant, 6-237 illus.
Larnaka (lahrnaka) or Larnaca. Chief spt. of Cyprus on s.e. coast; pop. 11,746; on site of anc. Citium.
La Rochefoucauld (roshfook'el), Francois, Duc de (1613-80). Fr. courtier. His *Maxims* (1655) is a collection of highly polished, witty sayings, expressing a pessimistic view of life, mainly on the theme of the unavoidable selfishness of human conduct; 3-455.
La Rochelle (lah rosh'el). Spt. of w. Fr.; pop. 37,900; once great maritime city and centre of Fr. Protestantism; siege, 6-400, 5-219; Villiers's expeditions, 2-103; 3-438.
Larousse. A Fr. encyclopedic dictionary, originally *Grand Dictionnaire Universel du XIX^e Siècle*, 15 vols. (1866-76) by Pierre Larousse (1817-75).
Larva. The young of any insect or other animal which attains adult form by going through a marked transformation, 4-448, 4-268; of sawflies, 6-501 of silk moth, 7-53.
Larwood, Harold (b. 1901). En. cricketer; his persistent and successful use of "leg-theory" fast bowling during the 1932-33 Test matches in Australia led to heated

controversy; played for Nottinghamshire; retired in 1938.
Larynx. Upper part of the air passage of throat; in a human being it includes the "Adam's apple" epiglottis, and vocal cords, 7-404.
La Salle, René Robert Cavalier, Sieur de (1643-87). Fr. explorer in N. Amer. Discovered the Illinois r. and sailed up the Niagara. In 1682 followed the Illinois and Mississippi rivi. to Gulf of Mexico, and claimed Mississippi valley (Louisiana) for Fr., 1-136, 4-69, 6-227.
Lashkar (las'kahr) (Persian *lashkar*, army, camp; *lashkari*, a servant of those in army, camp, or other authority). A foreign sailor, particularly a native of India, on board a British vessel.
Las Casas (las ka'sas), Bartolomé de (1475-1566). Sp. historian and missionary to W. Indies; popularly known as "the Apostle of the Indians," because he spent his life trying to secure better treatment of the Indians governed by the Spanish.
Laseaux Cave, near Montignac, S. France, cave-dweller's drawings, 2-282.
Lasker, Emanuel (1868-1941). Ger. chess champion, 2-328.
Las Palmas (las palmas'). Important port on E. coast of Grand Canary Isl. (Sp.); pop. 151,000; largest city and joint cap. of the group; cable station, 2-208, 7-103.
Lassa. See Lhasa.
Lassalle (lah-sahl'), Ferdinand (1825-64). Famous Ger. socialist, founder of Ger. social democratic movement; his vivid paradoxical personality and life formed basis of George Meredith's *The French Comedians*.
Last, a wooden "foot," in shoemaking, 2-16, 15 illus.
Last Judgment, The. Enormous painting by Michelangelo on the altar wall of the Sistine Chapel, Rome, 5-190, 191 illus.
Last Post. Bugle call in Brit. army. Word post refers to the mounting of the guard. Originally sounded to recall troops to quarters; first post at 9.30 p.m., last post at 10 p.m. Lights out at 10.30 p.m. Last post survives as a ceremony. Sounded at military funerals.
Last Supper, The. Large wall painting by Leonardo da Vinci, 4-483; and Holy Grail, 4-51.
Latakia (lah-tahk'ia), Syria. Mediterranean port 115 m. N. of Beirut; pop. 100,162; produces tobacco. Latakia tobacco; anc. *Laodicea (q.v.)*, 7-218.
La Tène. VII. S.E. end of Lake of Neuchâtel, Switz.; lake-dwellings, 5-105 and illus. f.; Iron Age, 2-284.
Latent Heat. Heat required to change the state of a substance from solid to liquid, (e.g. ice to water) or from liquid to gas; and heat pump 4-151.
Lateran, The. Palace in Rome, dating from 16th to 18th cents., now a museum; on site of anc. palace of Lateranus family, appropriated by Nero; later given by Constantine to Bishop of Rome and used by popes as residence until 14th cent.
Lateran Church, or church of St. John Lateran at Rome; built originally in Lateran palace by Constantine.
Lateran Councils. General councils held at Rome in the church of St. John Lateran; in 1123 the Concordat of Worms was confirmed, in 1159 the Papal schism was settled; in 1170 the conflict between empire and papacy was ended; in 1517 the doctrine of transubstantiation was formulated; and in 1517 the superiority of Pope over councils was asserted.
Lateral Pact between Pope Pius XI and Mussolini, acknowledging papal sovereignty over Vatican City 6-62, 6-316, 6-311, 7-383.
Latex. Milky juice secreted by various plants; rubber latex, 6-464; latex upholstery 6-466, 467 illus.
Lathe (lah). A machine used in turning, by means of which a piece of

LATIMER

wood or metal is rotated while a cutting tool is held against it.
Latimer, Hugh (d. 1555). Eng. Protestant reformer and martyr. 4-448.
Latin America. Collective name for Mexico and countries of South and Central America.
Latin Empire, established by Crusaders in 1188.
Latin: Language and Literature, 4-449; alphabet, 1-120; Caesar's Commentaries, 2-163; as medium of education, 6-503; and Eng. vocabulary, 3-281, 282, 7-129; Italian as direct heir, 4-329; Latin verso, 6-233; Romance languages, 6-427; Renaissance learning, 6-386.
Latin League. Confederation of cities of Latium in cent. Italy, existing from earliest historic times till 338 B.C.; and Rome, 6-430.
Latin Quarter, Paris, 6-79.
Latins. People of anc. Italy 6-429.
Latitude and Longitude, 4-462; finding longitude by chronometer, 2-383; at sea, 6-338.
Latium [lā'thiŭm]. Anc. dist. in middle of W. coast of Italy, inhabited by Latins; traditionally founded by Aeneas, 1-25.
Leto'na. In Rom. myth., mother of Apollo and Diana; in Gk. Leto.
Latter-Day Saints. See Mormons.
Letylia. Baltic republic of the U.S.S.R.; area 25,000 sq. m.; pop. 1,950,000; cap. Riga; 4-453, 6-478, 7-483.
Laud, William (1573-1645). Bishop of London, 1628-33; Archbishop of Canterbury, 1633-45. Executed on Tower Hill for high treason, 4-453.
Laudanum. A solution of opium in spirit; used as medicine, 5-521.
Lauder, Sir Harry (Maclean) (1870-1950). Scot. music-hall artist, a great favourite for Scottish dialect songs composed and sung by himself.
Lauds. One of the canonical hours—eight daily services in R.C. Church, 6-244.
Laue [low'e], Max von (b. 1879). Ger. physicist; Nobel prize in 1914; first used crystal for X-ray diffraction, 3-5.
Laughing Cavalier, The. Picture by Frans Hals, 4-121.
"Laughing Gas." See Nitrous Oxide.
Laughing Jackass. See Kookaburra.
Laughton, Charles (b. 1899). British-born American actor (naturalized 1950), notable in character parts on stage and screen (*Henry VIII*, *Mutiny on the Bounty*, *Rembrandt*).
Launcelot of the Lake. See Lancelot.
Launceston [laun'stən]. Old town in Cornwall 21 m. N.W. of Plymouth; pop. 4,650; George Fox, the Quaker, imprisoned here in 1655.

Launceston. Second city of Tasmania in N.E. on r. Tamar; pop. (with suburbs) 49,750; commerce with Victoria and S. Australia.
Launching, of ships, 7-41.
"Launching Money." Paid to crew of lifeboats; rate of pay, 4-495.
Laundry. Methods and machinery in, 4-454; bleaching methods, 1-481; Indian laundry-woman, 4-243 illus.; starch, 7-150.
Laundry Mark. Machine for imprinting with fluorescent ink, 4-151 illus.
Launfal, Sir. Knight of the Round Table and steward to King Arthur, in the Arthurian legends; hero of Lowell's *Vision of Sir Launfal*.
La Union. Spt. on Gulf of Fonseca, El Salvador; pop. 7,000; tortoiseshell products, 6-193.
Laura (1308-48). Lady loved by Petrarch and celebrated in his poems.
Laurel. Evergreen shrub, 4-455; leaves sacred to Apollo, 6-232; legend of Iphigene, 3-49; poisonous berries, 6-236.
Laurencin [lōrah'nən], Marie (b. 1885). Fr. painter; paintings in pastel blues and pinks, with figures of attenuated physique; designed settings for Diaghilev ballets (*Les Biches*).
Laurentian Library. Florence, Italy; chained books in, 4-488 illus.
Laurentian Plateau. Highland area in Canada.
Laurier, Sir Wilfrid (1841-1919). Canadian liberal statesman; first French-Canadian to hold premiership (1896-1911). G.C.B. 1897.
Laurium or Laurion, Greece. Hill range forming S.E. part of Attica 20 m. below Athens; silver mines.
Laurus Nobilis. Latin name of the bay or sweet bay laurel, 4-456.
Lausanne [lōzān], Switzerland. Beautiful city 1 m. N. of Geneva; pop. 106,807; 13th-cent. cath.; univ.; long the home of historian Gibbon; treaty between Allies and Turkey (ratified 1924), 7-481, 2-21.
Lava. Molten rock discharged from a volcano, 4-456; used to pave streets, 5-117, 7-404 with illus. f.
Laval, Pierre (1883-1945). French politician; premier 1931-32 and 1935-36; signed Franco-Soviet treaty 1935; vice-premier in Pétain's govt. June 1940; dismissed Dec. 1940; chief of Vichy govt. Apr. 1942, tried for treason Oct. 4, executed Oct. 15, 1945. Pétain and, 6-144.
Lavalava. A garment resembling a sarong, worn by the natives of Samoa, 6-194.
Laval-Montmorency, François Xavier de (1622-1708). First Rom. Cath.

bishop of Quebec; remarkable influence on French colonial govt.
Laval University. Nine of two educational establishments in Canada; one at Quebec, one at Montreal. Univ. at Quebec, estab. 1852, developed from seminary founded by Laval-Montmorency. Univ. at Montreal founded 1878.
Lavater [lavah'tər], Johann Kaspar (1741-1801). Swiss poet and mystic, founder of "science" of physiognomy, which professes to read character by outward appearance.
Lavender. Evergreen shrub, 4-456 for perfume, 6-123; cuttings, 3-504.
Lavenham. Village of Suffolk, Eng. Fine old timbered houses; church porch, 1-202 illus.
Lavran [lahveh'n], Charles (1845-1922). Fr. physician; awarded Nobel prize (medicine) in 1907; discoverer of malaria parasite, 5-93, 6-51.
Lavery [lā'verē], Sir John (1856-1941). Brit. portrait painter of Glasgow school; b. in Ireland; knighted 1918, became R.A. in 1921; 3-262.
Lavinia. In Rom. myth., daughter of Rom. King Latinus, and second wife of Aeneas, 1-25.
Lavinium. Anc. tn. of Latium, 17 m. S. of Rome; said to have been founded by Aeneas and named after his wife Lavinia.
Lavoisier, Antoine Laurent (1743-94). Fr. chemist; founded modern theory of chemical compounds, and combustion, 4-457, 2-317, 3-357; experiments with oxygen, 6-23.
Lava. Anc. monastery at Kiev, Russia; the centre of pilgrimages before Revolution of 1917, 4-403.
Law, Andrew Bonar (1858-1923). Brit. statesman of Scots-Canadian origin; M.P. (Liberal-Unionist) 1898; Conservative leader from 1911; vigorous opponents Irish Home Rule; chancellor of exchequer and leader of House in Lloyd George coalition, 1916-22; Conservative prime minister, 1922-23.
Law, John (1671-1729). Scot. financier; controller-general of Fr. finance, induced Fr. govt. to adopt a paper currency; established the "Mississippi Scheme" which ruined thousands of speculators.
Law, William (1686-1761). Eng. non-juring theologian and mystic; his *A Serious Call to a Devout and Holy Life* was a most influential work.
Law, 4-457; Courts of Justice, 2-520, 4-53; Hammurabi's code, 1-337; jury, 4-387; marriage laws, 5-123, 131; of Medes and Persians, 5-160; Roman, 6-110. See also Government; Law, International.

LAW

NOTED WRITERS IN THE LATIN TONGUE

Apuleius (b. A.D. 124), novelist and court pleader—"Apologia"; "Metamorphoses" (The Golden Ass).
Caesar, Julius (100-44 B.C.), historian—"The Gallic Wars"; "The Civil War."
Cato the Censor (234-149 B.C.), statesman and agriculturist—"De Re Rustica."
Catullus (87-47 B.C.), lyric poet—"The Poems."
Cicero (106-43 B.C.), orator and philosopher—"De Oratore"; "De Republica"; "De Finibus"; "Orations."
Claudian (d. A.D. 408), last of the classic poets—"Rape of Proserpine."
Ennius (239-169 B.C.), poet—"Annales."
Gellius, Aulus (A.D. 117-80), essayist and grammarian—"The Attic Nights."
Horace (65 B.C.), poet—"The Odes"; "The Epistles"; "The Satires."
Juvenal (1st century A.D.), satirist—"The Satires."
Livy (59 B.C.-A.D. 17), historian—"Ab Urbe Condita" (History of Rome).
Lucan (A.D. 39-65), poet—"The Pharsalia."
Lucretius (148-103 B.C.), satiric poet—"The Satires."
Lucretius (95-52 B.C.), poet and philosopher—"De Rerum Natura" (On the Nature of Things).
Marital (A.D. 40-104), epigrammatist—"Epigrammata" (The Epigrams).

Ovid (43 B.C.-A.D. 18), poet—"Metamorphoses"; "Fasti"; "The Art of Love"; "Tristia."
Persius (A.D. 34-62), poet—"The Satires."
Plautus (254-184 B.C.), dramatist and comic poet—"The Comedies."
Pliny the Elder (A.D. 23-79), natural philosopher—"Historia Naturalis" (The Natural History).
Pliny the Younger (A.D. 61-113), historian and essayist—"Epistolae" (The Letters).
Propertius (b. 51 B.C.), elegist—"The Elegies."
Quintilian (A.D. 40-118), orator and literary critic—"Oratorical Discussions."
Sallust (80-34 B.C.), historian—"Cathilina"; "Jugurtha."
Seneca the Elder (b. 61 B.C.), orator—"Controversiarum Liber"; "Suasoriaum Liber."
Seneca the Younger (4 B.C.-A.D. 65), stoic philosopher—"Moral Letters"; "Moral Essays"; "Tragedies."
Statius (A.D. 61-96), poet—"Thebais"; "Silvae."
Suetonius (A.D. 70-160), historian—"Lives of the Twelve Caesars."
Tacitus (c. A.D. 55-c. 119), historian—"Agricola"; "Germani"; "Annals and Histories of early Rom. Empire."
Terence (195-159 B.C.), dramatist—"The Comedies."
Varro (116-28 B.C.), grammarian—"De Re Rustica"; "De Lingua Latina."
Virgil (70-19 B.C.), epic poet—"Aeneid"; "Bucolica"; "Georgics."

Law, International. 4-489; fishery agreements, 3-382.

Law, The. Division of the Old Testament.

Law Courts, London. Situated in the Strand; the Royal Courts of Justice, as they are correctly called, were opened in 1883; 2-520-22 with illus.

Lawn. A bleached fabric of very fine cotton or linen.

Lawn Sprinkler, as example of jet propulsion, 4-270.

Lawn Tennis, 4-460.

Lawn Tennis Association, governing body of this game in Brit., 4-161.

Lawrence, St. (d. c. 258). "The Deacon," Christian martyr; called on by the judge to produce the Church's treasures, produced the poor people in his care; said to have been roasted to death on a gridiron, 5-138.

Lawrence, David Herbert (1885-1930). Brit. novelist and poet, with extreme views on woman and her position in the social structure. *Sons and Lovers, Women in Love, The Lost Girl, Aaron's Rod, The White Peacock*, are among his best novels, 3-291; influence of Dostoevsky, 5-473.

Lawrence, Ernest Orlando (b. 1901). Amer. physicist; developed the cyclotron; director of Radiation Lab., Univ. of California in 1936; helped to create atomic bomb; adviser to U.S. govt. on use of atomic energy in medicine and industry; Nobel prize for physics in 1939.

Lawrence, Gertrude (1898-1952). Brit. actress of stage and screen; successes in *Nymph Errand*, and with Noel Coward in *Private Lives*.

Lawrence, Sir Henry Montgomery (1866-57). Brit. soldier and colonial administrator, mortally wounded during Indian mutiny at the siege of Lucknow; 5-49.

Lawrence, John Laird Maif Lawrence, 1st Baron (1811-79). Brit. viceroy and governor-gen. of India, called "saviour of India," because his relief of Delhi during the Mutiny (1857) maintained Brit. rule; brother of Sir Henry Lawrence.

Lawrence, Sir Thomas (1769-1830). Brit. court painter, flattering but often superficial likenesses of Eng. beauties and European sovereigns; the successor of Reynolds as the most celebrated portrait painter of his day; pres. of R.A. from 1826 until his death, 3-260.

Lawrence, Thomas Edward (1888-1935). "Lawrence of Arabia." Brit. soldier, administrator, author, and scholar, 4-462, 3-108; influence in Arabia, 1-195, 7-48.

Lawrence, Tn. in Mass., U.S.A.; pop. 80,536; 5-145.

Laws of Motion. Newton's laws, 5-408.

Lawson, Henry (1867-1922). Australian poet, 1-321.

Lawson's Cypress. Conifer of the cypress group much grown in England, distinguished by its narrow cylindrical outline and very small cones.

Laxey. Village, Isle of Man; pop. 1,341; water wheel, 5-110, 4-217.

Laxton's Superb, dessert apple, 1-186 illus. f.

Layamon (c. 1200). Monk of Glos., Eng., wrote *The Brut*, 3-284.

Layard, Sir Austen Henry (1817-94). Brit. diplomat, archaeologist and writer; excavated ruins of Nineveh; he was appointed ambassador to Turkey in 1877; 5-442.

Laying, in gardening, 3-304.

Lay of the Last Minstrel, The. Narrative poem by Sir Walter Scott, 6-517.

Lays of Ancient Rome (1842). Collection of poems by Lord Macanlay, 5-58.

Lazarus. Brother of Martha and Mary; raised from the dead by Christ (John xi).

Lazarus. Beggar in parable of the rich man and the poor man (Luke xvi, 19-31).

Leach's Fork-tailed Petrel. Sea-bird, 5-147.

Leacock, Stephen Butler (1869-1944). Canadian educator and humorist,

b. Eng.; professor of political economy at Univ. of Chicago and later at McGill; won a new and wider public with his delightful nonsensical sketches (*Literary Lapae; Behind the Beyond; Moonbeams from the Larger Lunacy*), 3-303.

Lead (Pb). Metallic element of the silicon group; atomic no. 82; atomic weight 207.21; soft, heavy, blue-grey metal, 4-463, 3-234; alloys, 1-116, 116; and antimony, 1-175; lead poisoning, 6-236; melting point, 3-490; and uranium, 6-351.

Leadenhall Street, London. Shipping offices, 5-20.

Leader, in a newspaper, 5-405.

Leading Aircraftman, in R.A.F.; badge, 6-462 illus.

Lead Pencils, manufacture, 6-113 with illus.

Lead Poisoning, from water pipes, 4-463.

Lead Sulphide Cells, uses, 6-163.

Lead Tungstate, and white paint, 7-324.

Leaf. See Leaves.

Leaf-beetle. Type of beetle; destruction of food crops, 1-414.

Leaf Cutter Bee, 1-407, 409; egg, 3-171 illus.; jaws, 4-266 illus.; nest, 4-369.

Leaf-insect. An insect of tropical regions with wings which are amazingly leaf-like both in form and colour; family *Phasmidae*; camouflage, 4-266; protective coloration, 6-298 illus. f.

League. Geographical unit of length, formerly used for land, now limited to sea distances (3,456 statute miles).

League of Mercy. Founded in 1899 to promote the welfare of hospitals by obtaining subscriptions for King Edward's Hospital Fund for London, etc.

League of Nations, 4-463, 3-316, 317, 7-483; Germany withdraws, 4-10; and Mesopotamia, 4-278; and Woodrow Wilson, 7-455.

Leaquer. See Weights and Measures.

Le'ah. Elder daughter of Laban and first wife of Jacob (Gen. xxix).

Leamington [lem'ington]. (properly Royal Leamington Spa). Inland health resort in Warwickshire; pop. 38,190; mineral springs.

Leander. See Hero and Leander.

Leaning Tower of Pisa, 6-207 illus.

Leap Year, in calendar reckoning, 2-144, 7-435.

Lear, Edward (1812-88). Brit. artist and writer of nonsense verses, 4-464; limericks, 4-509; 2-356.

Learning, and educational methods, 3-166.

Lense-Lend. System of mutual aid among United Nations in 2nd World War, 4-465, 7-363; Roosevelt and, 6-450.

Least Common Multiple, in arithmetic. how to find, 3-336.

Leather, 4-466; for book-binding, 2-10; for boots and shoes, 2-14; for gloves, 4-35.

Leatherjacket. Destructive grub of the daddy-long legs.

Leaven. Substance used to produce fermentation. *See also Yeast.*

Leavers, John (19th cent.). Nottingham frame-smith; improvement of lace making machinery, 4-432.

Leaves, 4-469; of alder, 1-97, anatomy in growing plant, 2-25 illus. f.; botanical classification of, 2-24; chlorophyll in, 4-469, 1-447; modification of cactus, 6-217; photosynthesis, 6-128 with diag.; transpiration, 6-215; of water lily, 7-428; of water plants, 7-429.

Leaves of Grass. Collection of poems by Walt Whitman, 7-440.

Lebanon. Rep. of S.W. Asia, between Syria and Palestine; area, 3,400 sq. m.; pop. 1,248,000; cap. Beirut; 4-472; flag, 3-385 illus. f.; Christian pop. 1-195; mandated territories of Fr., 7-483; in 2nd World War, 7-490; defeated by Israel, 4-303.

Lebanon, Cedars of, scarcity of, 4-472.

Lebanon Mts. Range in Lebanon parallel to Anti-Lebanon mts., 4-472.

Lebensraum [lê'bén'sraum]. Ger. "living space"; slogan of Ger. nationalism used to justify Ger. expansion into other people's lands; 3-408.

Leblanc (leblahn'), Nicolas (1743-1806). Fr. chemist, won prize offered (1775) by Fr. Academy for method of making soda from common salt; 2-826, 4-215, 7-78.

Leblanc Process of soda mfr.; and hydrochloric acid, 4-215.

Le Bourget [le boor'zhâ]. Airport of Paris, 7 m. w. from the centre of the capital; greatly enlarged and rebuilt in 1937.

Lebrun [le brén'], Albert (1871-1950). French statesman; minister for colonies 1911-13 and 1913-14, senator 1920; president of republic 1932-40; imprisoned by Gers 1943-44.

Le Brun, Charles (1619-90). French artist; first painter to Louis XIV. helped to found Academy of Painting and Sculpture 1648; and French School in Rome 1666; first director of Gobelins factory, 3-439.

Lebrun, Marie E. L. Vigte. See Vigte-Lebrun.

Lech River. Rapid stream rising in Vorarlberg Alps at height of 6,120 ft.; flows N. through Bavaria 180 m., joining Danube below Donauebrunn.

Lechwe [lê'shwê], species of waterbuck, 1-60 illus.

Leathin, white waxy fatty substance obtained from egg yolk, soya beans, etc.

Lecky, William Edward Hartpole (1838-1903). Brit. historian and publicist; was a member of Parliament and an opponent of Home Rule for Ireland. (*A History of European Morals; The Rise and Influence of Rationalism in Europe.*)

Leclanché Dry Cell, 1-386 illus.

Leclerc [lêklâr], Gen. Jacques, assumed name of Philippe, Viscount of Haute-cloque (1902-47). Fr. soldier escaped Ger. captivity in 1910, and joined de Gaulle; went to Cameroun in 1942 marched Fr. and native troops 1,500 m. across Sahara from Fort Lamy (Chad Territory) to Mareth Line, 6-486; commanded Fr. 2nd armoured div., first troops to enter Paris; received Ger. surrender there, Aug. 25, 1944; killed in aircraft accident 1947.

Leconte de Lisle [lekontêl] Charles Marie (1818-94). Fr. poet, chief of modern Parnassian school ("Poemes antiques"). "Coldness cultivated as a kind of artistic distinction seems to turn all his poetry to marble in spite of the fire at his heart."

Le Corbusier (pseudonym of Charles Edouard Jeanneret, b. 1887). Swiss architect, 4-473, 1-218.

Le Creuset. Industrial tn. France (great ordnance works founded by Adolphe and Eugene Schneider in 1836. Pop. 24,196; 3-434).

Leotern. Reading desk; reason for eagle form, 3-143.

Ledger. A book in which all cash transactions of a business are entered, the debit amounts on one side and the credit amounts on the other; 2-11.

Ledo Road. Milit. highway of 2nd World War; joined Ledo railroad N.E. Assam, to Burma Rd. at Mongyu, 478 m. long; built by U.S. army engineers under Gen. Stilwell as supply road; disused after war.

Leduc, Alberta, Canada; oilfield, 1-93.

Lee, Nathaniel (c. 1653-93). Eng. dramatist and poet; among his best-known tragedies were *The Rival Queens, Nero, and Theodosius*.

Lee, Robert Edward (1807-70). Amer. Confederate general, 4-474.

Lee, Sir Sidney (1859-1926). Brit. author and educator; prof. of P. Lang. and Lit. at East London Coll. for 11 years; editor of *Dictionary of National Biography*.

Lee, William (1850-1810). Eng. inventor of knitting machine, 4-419.

Lee of Fareham, Arthur Hamilton Lee 1st Viscount (1868-1947). Brit. poli-

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tion; presented his country seat, *Chesham*, to the nation for use by the prime minister, 2-327.

Leach, John (1817-64). Brit. comic artist; contributed to *Punch* from 1841. Also illustrated books, incl. *Dickens's Christmas Carol*.

Leach. A blood-sucking ringed worm of the order *Hirudinea*, used for medicinal purposes; inhabits pools and marshy places; it has two suckers; British species are small, but in the tropics some reach many inches in length; 7-500.

Leeds, Thomas Osborne, Duke of (1831-1912). Eng. statesman; created Earl of Danby in 1874; he was highly esteemed by Charles II. but in 1678 was charged with bribery and confined in the Tower for five years; on his release he espoused the cause of William of Orange.

Leeds. Industrial city in W. Riding of Yorks, Eng.; pop. 504,954; 4-478; cloth and machinery mfrs., 3-249.

Leeds. Vil. of Kent, 4½ m. from Maidstone; here is famous Leeds Castle, on a small isl. in a branch of r. Medway.

Leeds, University of. Eng. univ. founded in 1904 to replace Yorkshire College, founded in 1874, one of the colleges of Victoria Univ., Manchester; besides usual faculties, it has textile, engineering, and agric. departments.

Leeds and Liverpool Canal, 4-475.

Leek. Variety of onion, 5-512.

Leeuwarden (lĕ'varden), Netherlands. Cap. of prov. of Friesland; pop. 79,134; flourishing trade in cattle, grain, fish.

Leeuwenhoek (lĕ'vuhnhoek), Anthony Van (1632-1723). Dutch naturalist; his researches with microscopes of his own making laid the foundations of bacteriology; 5-182; and bacteria, 1-343; and capillaries, 1-193; and microscope, 5-185.

Leeward (lĕ'vord). Away from the wind; the opposite of windward.

Leeward Islands. Brit. colony in Lesser Antilles, W. Indies, comprising 4 presidencies, Antigua (with Barbuda and Redonda); St. Christopher-Nevis (St. Kitt's, Nevis, Anguilla); Montserrat; and Brit. Virgin Isls.; 422½ sq. m.; pop. 103,847.

Leeway. See Nautical Terms (list).

Lefort, François Jacob (1653-99). Russ. diplomatist. Friend and adviser to Peter the Great, 6-145.

Left. Term used in European politics, to denote the party holding the more advanced views; use arose from fact that in Continental legislative chambers members sit in semi-circle facing the Speaker—the Socialists and Communists being on left, Conservatives on the right.

Leg, in anatomy; bandage for fracture, 3-336 with illus.; muscles, 5-298 illus.; of caterpillars, 2-263; of insects, 4-261.

Le Gallienne, Richard (1866-1947). Brit. critic, essayist and poet, remembered chiefly for his novel *The Quest of the Golden Girl* (1896). Also wrote several vols. of poems and essays.

Legal Tender. Money that may lawfully be offered in payment of debt; bronze to one shilling, silver to £2, and gold and currency notes to any amount are legal tender.

Legaspi, formerly Albay, tn. on Luzon, Philippine Is., pop. 36,000.

Legato. See Musical Terms (list).

Legend of the Kingfisher, The. Story, 4-405.

Legends. See Stories and Legends.

Leghorn or Livorno. Third commercial port in It., in Tuscany on w. coast; pop. 144,700; Leghorn straw hats, leather, glass, iron and copper products; shipbuilding.

Leghorn. A breed of fowls, introduced into Eng. from It.; good layers, table, and show birds; 6-277 illus. f.

Legion. A complement of soldiers, 4-475; in Rom. army, 1-246.

Legion of Honour. Fr. order of merit founded by Napoleon I in 1803, 5-530, 4-476.

Legislature. The law-making body of any govt. unit, such as the Houses of Parl. in the United Kingdom. For other law-making bodies see under their proper names, as Congress; Diet; Parliament; etc.

Legnano (lĕ'nanoh), It. tn. 16 m. N.W. of Milan; pop. 27,254; cotton and silk mfrs.; Lombard League defeated Frederick Barbarossa at, 4-308.

Legros (lĕ'gro'), Alphonse (1837-1911). Fr. painter and etcher, for nearly 30 years a teacher in London, where his severe yet dignified realism and simple technique exerted an exceedingly powerful influence on the development of Eng. art; 3-300.

Leg Strokes, in swimming, 7-207, 209 illus.

Legumin(e). A protein obtained from leguminous plants.

Leguminosae. Plant order containing the peas, beans, and vetches and similar papilionaceous flowers; mimosas are primitive examples; acacias, 1-8; lucerne and nitrate, 5-49, 5-445; nitrogen fixing bacteria, 5-444; pea, 6-99.

Lehar, Franz (1870-1948). Hungarian composer of light music (*The Merry Widow*; *The Count of Luxembourg*; *The Land of Smiles*, etc.).

Le Havre. See Havre.

Leibniz (lĕ'bnits), Gottfried Wilhelm (1646-1716). Ger. philosopher, mathematician and scientist, 6-160; and calculating machine, 2-167; invention of calculus, 5-148.

Leicester (lĕ'ster), Robert Dudley, Earl of (c. 1531-88). Eng. statesman and soldier, favourite of Elizabeth I. 3-232. His marriage to Amy Robsart is the theme of Scott's *Kenilworth*, 4-397.

Leicester, Simon de Montfort, Earl of. See Montfort, Simon de.

Leicester. City and co. tn. of Leics, Eng., on r. Soar; boots and shoes and hosiery mfrs.; pop. 285,061; 4-476.

Leicester Sheep, 7-22.

Leicestershire. Co. of Eng.; area 823 sq. m.; pop. 630,893; co. tn. is Leicester; 4-476.

Leicestershire Wolds. A continuation of the Cotswold limestone ridge, 4-476.

Leicester Square, in London, N. of Trafalgar Square; it contains a garden in which is a fountain surmounted by a statue of Shakespeare—formerly called Leicester Fields.

Leiden. City in Netherlands, noted for university; pop. 90,673; 5-372 illus.; univ., 7-367 illus.

Leigh. Tn. in Lancs, Eng., 11 m. N. of Manchester; manufactures o. silks and cottons; iron foundries; breweries; pop. 48,710.

Leigh-Mallory, Air Marshal Sir Trafford (1892-1944). Brit. air officer; A.O.C.-in-C. Fighter Command R.A.F. 1942. Allied Air C.-in-C. 1943-44; and Normandy invasion, 5-450.

Leighton, Clara (b. 1899). British engraver. One of leaders of 20th cent. revival in wood-engraving; illustrated books incl. *The Farmer's Year*, *Four Hedges*.

Leighton, Frederick Leighton, Baron (1830-96). Brit. painter and sculptor. Most of his works are illustrations to classical stories and reveal a love for beauty of line and form, the figures in his paintings having a sculptural quality; 3-273, 3-124 illus.

Leighton Buzzard. Tn. of Beds, Eng.; pop. 9,023. Market gardening centre; principal industry paper-making; 1-404.

Leinster. Anc. prov. of Ireland, 4-281, 284.

Leipzig. Commercial city in Saxony, E. Germany; pop. 607,655 (1946); 4-476, 4-4; fur dyeing trade, 3-496; and Wagner 7-408. For battles (1631 and 1813) see Battles (list).

Leipzig Fair, foundation, 3-326; revival, 4-477.

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Leipzig. University of, 3rd in size and 2nd in age of the universities of Ger.; established by 400 teachers and students who seceded from univ. of Prague through Hussite agitations; faculties of medicine, law, theology, and philosophy; 4-176.

Leiria. Tn. in Portugal; pop. 76,678 6-267.

Leitch, Charlotte Cecilia (Ceeli) (b. 1890). Brit. golfer. Won British open ladies' championship 1914, 1920, 1921, 1926, and French ladies' championship five times; 4-44.

Leith (lĕth), Scot. Spt. incorporated with Edinburgh in 1920; on Firth of Forth; shipbuilding; 3-161.

Leith, The Water of. It. in Scot., rises in Pentland Hills and flows N.W. to sea at Leith, 5-40.

Leith Hill, Surrey, Eng.; 905 ft., 3-111, 7-196.

Leitmold, in opera, 7-409.

Leitrim. Co. of Irish Rep., in N.W. of prov. of Connaught. Area 589 sq. m.; pop. 41,309; co. tn., Carrick-on-Shannon.

Leix (lĕsh). Co. of Irish Rep., formerly Queen's Co. Fertile agricultural and pastoral land; area 661 sq. m.; pop. 48,423. Portlough is the co. tn.

Lek. See Money (list).

Leiland, or Layland, John (c. 1500-52). Eng. antiquary; chaplain and antiquary to Henry VIII; on Birmingham, 1-473.

Le Locle. Tn. Switz., watchmaking centre; pop. about 12,000; 4-387.

Lely (lĕ'li), Sir Peter (1617-80). Eng. court painter, b. Ger., of Dutch family; famous for portraits of beautiful women of court of Charles II; Charles I and Cromwell also patrons; 3-259.

Leman, Lake. See Geneva, Lake of.

Le Mans. Tn. of France on r. Sarthe, s.w. of Paris; magnificent Gothic cath.; famous for road-race circuit for sports cars; battle (1871), 3-456.

Lemberg. See Lvov.

Lemming. Small rodent, common in Norway, remarkable for migrating periodically to the sea in enormous numbers, 4-477.

Lemnos. Gk. isl. in N. Aegean; area 180 sq. m.; pop. 25,000; held in turn by anc. Greeks, Byzantine Empire, Italians, and Turks; products incl. grain, wine, fruit, tobacco.

Lemon, Mark (1809-70). Brit. journalist and dramatist; he was one of the founders, and first editor, of *Punch*; he produced upwards of fifty plays, operettas, etc.

Lemon. A citrus fruit, 4-477; juice of, and scurvy, 7-415; juice as invisible ink, 4-262.

Lempira. See Money (list).

Lemprière, John (c. 1768-1824). Brit. classical scholar, chiefly notable for his *Classical Dictionary* which has been added to by others; Keats's study of, 4-394.

Lemur. A small monkey-like animal, 4-478, 5-240 illus. f.

Lena. R. of Siberia, rises in Baikal Mts. in s.; empties into Arctic Ocean, forming vast delta; length, 2,890 m.; 1-268, 6-472, 7-48.

Le Nain, family of Fr. painters, Antoine (c. 1588-1648), Louis (1593-1648), and Mathieu (1607-77), 3-439; Carl Players, 3-443 illus.

Lenau, Nikolaus (1802-50). Ger. poet and writer, 4-13.

Lease-Lease. See Lease-Lease.

L'Enfant, Pierre Charles, Major (1754-1825). French engineer, planned the city of Washington, D.C., U.S.A.; 7-421.

Langien (lĕnglĕhn), Suzanne (1899-1938). French lawn-tennis player; won ladies' singles championship, Wimbledon 1919-23 and 1925; became professional in 1926; 4-462.

Lengua Indians. Tribe living in the Gran Chaco, Paraguay, S. Amer., 6-77 illus.

Lenin, Vladimir Ilyich (1870-1924). Russ. Bolshevik leader, 4-478; and Russ. revolution, 6-476; tomb, 6-475 illus.

LENINAKAN

Leninakan (formerly Alexandropol). Town in Armenia (U.S.S.R.); pop. 87,000; situated 80 m. s.w. Tbilisi; earthquake (1926), 1-242.

Leningrad. City of the U.S.S.R., originally St. Petersburg, then Petrograd; founded by Peter the Great in 1703; pop. (1939) 3,191,000; 4-479; revolution, 7-481; in 2nd World War, 7-493.

Lenin Peak. Mt. in Tadzhikistan U.S.S.R., 23,390 ft., 6-478.

Lenoir, Etienne (1822-1900). French engineer; gas engine invention, 3-507, 4-273.

Lenormand, Henri René (1882-1951). Fr. dramatist, notable for his psychological plays.

Lens [lɑns]. Fr. coal-mining and iron-mg. city 135 m. N.E. of Paris; pop. 30,000; victory of Fr. under Prince of Condé over Sp., 1648.

Lens, in optics, 4-480; 5-522; in camera, 6-170, 171 illus.; of eye, 3-331, 332 with diag.; in microscope, 5-195; of rock crystal, 6-320; for spectacles, 7-126, 127.

Leathall, William (1591-1662). Eng. politician, who held the office of Speaker in the famous "Long Parliament"; he supported the Parl. in the Civil War, but became a Royalist at the Restoration.

"**Leathen**," name for ether used by W. T. G. Morton, 1-142.

Leontia. A leguminous plant, the seeds of which have great food value, 4-482, 6-297.

Lent Lily. See Daffodil.

Lenz's Law. A fundamental law in electrical work which states that the direction of a current induced in a circuit as a result of a change in the interlinkages between the circuit and a magnetic field is such as to oppose the motion which produces it.

Leo (the Lion). One of 12 signs of the Zodiac, 7-524 illus.

Leo I (c. 390-461). Pope; and Attila, 4-208, 1-308.

Leo III (c. 750-816). Pope, 795-816; crown: Charlemagne, 4-187, 4-306; and Leonoclam, 2-150.

Leo X (1475-1521). Pope 1513-21, member of the Medici family. Chiefly remembered as a patron of Raphael, and other artists and poets; 5-160.

Leo XIII (1810-1903). Pope 1878-1903, at a time when the Italian govt. had deprived the Papacy of its authority as ruler of Rome. Chose to become a voluntary prisoner in the Vatican, which remained Papal territory, 7-383.

Leofric (d. 1072). Bishop of Exeter and chancellor to Edward the Confessor; and the *Exeter Book*, 3-326.

Leominster [lem-ster]. Tn. in Herefordshire, Eng.; pop. 6,289; glove-making, 4-169.

Leon, Mexico. City 200 m. N.W. of Mexico City; pop. (1910) 74,200; leather, textiles; trade in cereals.

Leon. Tn. in Nicaragua; pop. 51,720; fine public buildings; 5-430.

Leonardo da Vinci (1452-1519). It. painter and scientist, 4-482, 4-319; as an anatomist, 1-163, 5-162; theories of flight, 1-27; model helicopter, 1-28; drawing by, 3-124 illus.; The Last Supper, 1-181 illus.; Mona Lisa, 5-47 illus.

Leoncavallo [lɔnkavallɔ], Ruggiero (1859-1919). It. composer (*Il Pagliacci*); 5-515, 519.

Leonidas (d. 480 B.C.). King of Sparta; at Thermopylae, 6-130.

Leonids. Group of meteors, so called because they appear to radiate from a point in the constellation of Leo. They occur in greater brilliancy and profusion every 33½ years.

Leopard. Animal of the cat family, 4-484; protective coloration, 6-296.

Leopold [lɔpəhrdɔ], Giacomo, Count (1798-1837). It. lyric poet, prose-writer, and scholar, master of finished style and slave of pessimism; 4-330 with portrait.

Leopold I (1840-1909). Holy Roman Emperor, elected in 1868; defeated Turks and French.

Leopold II (1747-92). Holy Rom. Emp., elected in 1790; son of Maria Theresa and brother of Marie Antoinette.

Leopold I (1790-1865). King of the Belgians, 4-484, 1-418; and Victoria and Albert, 1-92.

Leopold II (1835-1909). King of the Belgians, 4-484; and Belgian Congo, 2-481, 1-55, 1-418.

Leopold III (b. 1901). King of the Belgians, 1934-51; 4-485, 1-418.

Leopold I (1157-94). Duke of Austria. Succeeded 1177; went on Crusades 1182 and 1190; quarrelled with Richard I in Palestine; portrait, 4-129 illus.

Leopoldville. Cap. of Belgian Congo, pop. 160,304; 2-481.

Lepanto, Battle of (1571). Naval battle in which Turks were defeated by the Christian League, 7-335, 6-155; painting, 5-353 illus.

Lepidolite. Type of mica, 5-190.

Lepidoptera. Order comprising the butterflies and moths, 4-270.

Lepidus, Marcus Aemilius (d. 13 B.C.). Wealthy Roman, triumvir with Mark Antony and Octavian (Augustus); 1-309.

Leprechauns. Small creatures, usually old men, of Irish folklore, 3-338.

Leprosy. Infectious disease; Father Damien's work, 3-34.

Lepcis Magna. Anc. city in Libya, built by Romans; ruins, 4-489, 1-53.

Leptocardi. A group of primitive animals, just below true vertebrates; includes lancelets.

Le Puy-en-Velay. Tn. in Fr.; centre of lace-making industry; pop. 22,705; 4-129 illus.

Lérda [lɛrdə]. Sp. Walled cath. city 80 m. W. of Barcelona; pop. 46,400; as Celtiberian Iberia heroically resisted Romans; leather, glass, textiles.

Lérins. Is. in Mediterranean off Cannes, Fr.; monastery, 5-213.

Lermontov, Mikhail (1814-12). Russ. poet and novelist, 6-140.

Lerwick [lɛrk]. Cap. of Shetland Is.; pop. 5,538; sp. with fine natural harbour; steamer services, 7-27.

Le Sage [le sazh], Alain René (1668-1747). Fr. novelist and dramatist, wrote *Gil Blas*, a masterpiece of picaresque fiction.

Leslie, Charles Robert (1794-1859). Brit. painter; wrote standard biography of John Constable; compared with Frith; 3-261.

Leslie, David (1691-82). Scot. gen. who fought with distinction for the Parliament at Marston Moor and helped to defeat Montrose at Philiphaugh; he afterwards supported Charles II and was taken prisoner at Worcester; Charles II later created him Earl of Newark.

Lesseps, Ferdinand de (1805-94). Fr. engineer; built Suez Canal, 7-181; and Said Pasha, 3-176; and Panama canal, 6-54.

Lesser Celandine. See under Celandine.

Lesser Redpoll. Bird, 3-353, 4-515.

Lesser Whitethroat. Bird; migration, 5-204 illus. f.

Les'sing, Gotthold Ephraim (1729-81). Ger. critic and dramatist; helped free Ger. literature from Fr. influence; chief works, *Emilia Galotti*, *Mina von Barnhelm*, *Laokoön*; 4-13.

Le Sueur, Hubert (c. 1595-c. 1650). Fr. sculptor; came to Eng. 1628, and made the bronze statue of Charles I that still stands at Charing Cross, London.

Leitchworth. In Hertfordshire, 2 m. N.E. of Hitchin; the first garden city to be laid out in Eng. (1903); pop. 20,320; 4-173.

Lethbridge, John. Brit. seaman, invented a diving suit, 3-91.

Lethe [lɛθɛ]. In Gk. myth., r. of oblivion.

Le'to, in Gk. myth., mother of Apollo and Artemis; known as Latona by the Romans.

Le Touquet, tn. of France, on coast s. of Boulogne; a favourite pleasure resort, esp. with Eng. people; resident pop. 5,000.

LEWIS

Letter-writing, in Japan, 4-349 illus.

Letish. Language of the Letts, 4-453.

Letts. Slav people constituting 76 per cent. of population of Latvia, 4-463.

Lettuce [lɛt'is]. An annual plant, native of E. and cent. Asia; introduced into Eng. about 1520, it is cultivated chiefly as a salad plant.

Leu. See Money (list).

Leucippus (6th cent. B.C.). Gk. philosopher, contemporary of Zeno and Empedocles; and theory of atoms, 1-269.

Leucocytes [lɛukɔɪts]. White corpuscles, also called phagocytes; their work in the blood, 1-489.

Leucocytosis. Increase of white blood corpuscles, 1-491.

Leucra, Greece. Village in Boeotia; battle of (371 B.C.), 7-267, 266 illus.

Leukaemia. Blood disorder, 1-491.

Léuna [lɔ'na]. Synthetic oil plant, 12 m. W. of Leipzig, largest in Ger.; put out of action in 1945 by repeated bombing of Allied air forces; reconditioned by Russ. during occupation.

Leuthen, Battle of (1757). In Seven Years' War, 7-2.

Levant [lɛvnt]. ("rising (of sun)," hence, "east"). Term applied to E. Mediterranean and its coastlands.

Levée. Reception held by the Brit. sovereign in daytime and attended by men only.

Levee. In U.S.A., a wall of earth built along the bank of a river to control its flow and to prevent flooding.

Levellers. Political faction under the Commonwealth; and Cromwell, 2-331.

Le'ven [lɛ'vɛn]. Alexander Leslie, 1st Earl of (c. 1580-1661). Scot. soldier who fought bravely for Charles I. and Gustavus Adolphus of Sweden, returning from Sweden he defeated Charles I's army at Newburn, and later took part in the battle of Marston Moor.

Leven, r. flowing from Loch Leven, Kinross-shire, Scot., 16 m. long 4-412.

Leven, r. of Scot., issues from Loch Lomond and flows to Clyde at Dumbarton; valley, 6-513 illus. f.

Leven, Loch. Lake in Kinross-shire, Scot.; area nearly 6 sq. m.; it contains Castle Is., with ruins of a castle that was the prison of Mary Queen of Scots, and is famed for its trout; 4-412 with illus.

Le'ver, Charles James (1806-72). Irish novelist, born story-teller, with inexhaustible fund of bolstering extraneous gaudy portraying humorous side of Irish life (*Charles O'Malley*; *Harry Lorrequer*).

Lever, in mechanics, 5-157, 6-302.

Leverhulme [lɛvɜrhɜm], William Lever, 1st Viscount (1851-1925). Brit. manufacturer, founder of soap-making firm of Lever Bros., Ltd. (now Unilever); built Port Sun light, Cheshire (1888) as model village for workpeople.

Levi. The priestly tribe of the Israelites, 4-374.

Leviathan [lɛv'ɪəθən]. A huge aquatic monster, e.g., that described in the Book of Job; also title of a work by Thomas Hobbes (1588-1679) in which the state, as a benevolent monster, creates order out of chaos and is thereby entitled to wield absolute power and to command complete allegiance.

Leviticus. The 3rd book of the Old Testament, containing priestly laws.

Lewes, George Henry (1817-78). En-writer and journalist; and Geo. Eliot, 3-230.

Lewes. Co. tn. of Sussex, Eng.; pop. 13,101; 7-196; battle (1204), 4-1-5-252.

Lewis, Cecil Day (b. 1904). British, and (as "Nicholas Blake") novelist. Works include *Collected Poems* 1929-33; *Noah and the Ark* (created C.B.E. in 1950). Prof. poetry at Oxford University, 1951.

LEWIS

Lewis, Clive Staples (b. 1898). Brit. writer on relig. subjects (*The Silent Planet*; *The Problem of Pain*; *The Screwtape Letters*).

Lewis, Isaac Newton (1858-1931). U.S. army officer; inventor of Lewis light machine-gun, 5-64.

Lewis, John Llewellyn (b. 1890). American labour leader. President of United Mine Workers of America; took prominent part in labour disputes of 1936-37. Former pres. of Congress of Industrial Organizations, a federation of labour unions. Led big coal strikes in U.S.A. in 1915-16.

Lewis, Sinclair (1885-1951). Amer. novelist; realistic social critic (*Harbort*, *Main Street*, *Elmer Gantry*); awarded Nobel literature prize 1930; 7-365.

Lewis, Butt of, Scot. A promontory in N. of Lewis-with-Harris Is., Scot., rising to a height of 145 ft.

Lewis and Clark Expedition. Exploration in the U.S.A. 1804-06 up the Missouri to the Columbia and the Pacific coast by Meriwether Lewis (1774-1809) and William Clark (1770-1838), sent by President Jefferson. This journey began the opening-up of the West.

Lewis Gun. Type of machine-gun, 5 61.

Lewisham. Met. bor. of S.E. London; pop. 227,551; 5 27.

Lewisian. Name of pre-Cambrian rocks, mainly granites and gneisses; named after Is. of Lewis, in Hebrides, where they occur.

Lewis-with-Harris. Isl. of the Outer Hebrides, Scot.; Stormoy is chief port; Harris twerds, 4 152.

Lexicon. A type of dictionary, 3 88.

Lexington, Kentucky. Agri-cultural and mfg. centre; pop. 53,534; famous horse market and race course.

Lexington, Massachusetts, U.S.A. Tn. 11 m. N.W. of Boston; pop. 17,335; scene of first shots in War of Amer. Independence, 1 137.

Leybourne, Sir William de (d. 1309). Eng. sailor; first recorded as being termed admiral, 1 20.

Leyden. See Leiden.

Leyden Jar. Electrical capacitor consisting of a glass jar having its inner and outer surfaces coated with a conducting material. Its use gave name to jar, a unit of capacitance. Its discovery is usually associated with the names of Muschenbroek and Cuneus, of Leyden University, in the Netherlands (1746), although von Kleist, of Camlin, claimed to have invented it in 1745; 3-210.

Ley's School, Cambridge. Eng. boys' public school, founded by Wesleyans in 1874.

Leyte [lɛ'ɪt], one of the Philippine Is.; 2,785 sq. m.; hemp, bananas, sulphur, in Jap. occup., 1912 11; U.S. naval-air victory in Leyte Gulf, Oct. 1941, 7-198.

Leyton. Bor. of Essex; pop. 105,183; 5-27.

Lhasa [lɪh'sə] or **Lassa.** Cap. of Tibet in N.; seat of Dalai Lama; pop. 59,900; 7-272, 273 illus. f.

Liao-ho [liə'ho]. R. of Manchuria; rises in Great Khingan Mts., flows E. along Chihli border, then S. to Gulf of Liaotung, 5-112.

Liakoura. See Parnassus, Mt.

Liaotung [liə'wʊŋ] Peninsula, Manchuria, projects s.w. into Yellow Sea between gulfs of Liaotung and Korea; Dairen and Port Arthur on Kwantung Territory (formerly leased to Japan) at tip; 5-112.

Liaoyang [liə'wɒŋ]. City in Manchuria on rly. pop. 100,000; captured by Japanese (1904) in Russo-Japanese War.

Liaquat Ali Khan. See Khan, Liaquat Ali.

Liard River, Canada. Rising in N. Brit. Columbia and flowing N.W. to Mackenzie; 5-64.

Libau. See Liepāja.

Libel (god). See Dionysus.

Liberal Party. Political party of Gt. Brit., 4-485; Gladstone and, 4-26;

Asquith and, 6 20; Lloyd George and, 4-531; curtailment of Lords' powers, 1911, 6-106; measures passed 1906-11, 7-351; rivalry with Conservatives, 2-487.

Liberia. Negro republic on W. coast of Africa; 43,000 sq. m.; pop. est. 2-3,000,000; 4 485, 7 140, 7 60; flag, 3-383 illus. f.

Liberty Statue of. New York harbour, 5-413, 2-462.

Liberty Bell, rung in Philadelphia, U.S.A., to commemorate Independence Day (July 4, 1776), 6-153 illus.

Libra (the Balance or Scales). One of the 12 signs of the Zodiac, 7 324 illus.

Librarianship, as a career, 2 236.

Library, 4-486; at Alexandria, 1 101; at Brit. Museum, 2 88, 90; Cam. bridge Univ., 2 182; at Leipzig, 4 477 illus.; Renaissance libraries, 6 386.

Libretto. See Musical Terms (list).

Libreville. Cap. and port of Gabon, French Equatorial Africa; pop. 4,500; 2 182, 483.

Libya. Kingdom in N. Africa; area 679,358 sq. m.; pop. 885,400; Tripoli and Benghazi are dual capitals; 4 488, 7 489.

Libyan Desert. Part of Sahara, S. of Tripoli and W. of Egypt, 3 173, 3 78.

Licence. Form of taxation; issued by Post Office, 6 272; for fishing, 3 381.

Licensing Laws. Term applied to laws relating to the restriction of the sales of intoxicants under licence, 1 96.

Lichen [lɪ'kɪn]. "Partner-ship" plant, composed of algae within fungi, 4-490, 1-101, 3 189.

Lichfield. City in Staffs. Eng.; pop. 10,621; famous cathedral; birth place of Dr. Johnson; 4 491; cathedral, 3 252.

Lich-fowl. See Nightjar.

Lichi Nut. Fruit of tree of the soap-berry family, grown in Far East; outer covering hard and scaly, seed black, small and hard. Flesh surrounding seed is firm and sweet, 5 187.

Licinian Laws. Six laws of anc. Rome passed B.C. 367 in tribuneship of Gaius Licinius; virtually ended the struggle between the patricians and plebeians; 6 430.

Licinian. See Valerius.

Licorice. See Liquorice.

Liddel, R. of Scot., 6 460.

Liddell, Henry George (1811-98). Brit. cleric and scholar; dean of Christ Church (1855-91). With R. A. Scott prepared standard *Greek Lexicon* (1843); and *Lewis Carroll*, 2 251.

Lidgett, John Scott (1851-1953). Brit. Methodist minister. Founder of the Bermondsey Settlement 1891; for many years member of the London County Council.

Lidice [lɪd'ɪtʃ]. Mining village of Czechoslovakia in Kladno coalfield, 20 m. W. of Prague; completely destroyed by Nazis in June 1942 on pretext that it had sheltered the killers of Heydrich. 192 men murdered; 196 women imprisoned, and 105 children deported. New village founded June 15, 1947.

Lido [lɪ'do]. Italian for shore; at Venice, 7-387; "Lansbury's Lido," bathing beach in Hyde Park, London.

Lie, Trygve (b. 1896). Norwegian statesman; first sec.-gen. of U.N., 5-467.

Liebig [lɪ'bɪg]. Justus von, Baron (1803-73). Ger. chemist and teacher; established first laboratory course for teaching chemistry; proved that "organic" substances are subject to same chemical laws as inorganic ones and synthesised many organic compounds; proved animal heat the product of combustion of food; his studies of plant chemistry and fertilisers founded agricultural chemistry.

Liechtenstein. Principality of Europe, formerly Austrian, but independent since 1818; 4-491.

Lige. Tn. Belgium; pop. 156,193; 4-493, 1-117, 1-420 illus.

Liegnitz [lɛ'ɡnɪts] or **Lignitz.** Poland. Former Ger. mfg. and trade tn. in

LIGNY

Silesia; pop. 76,500; victory of Frederick the Great (1760), 7 2.

Liepāja, formerly **Libau,** Latvia S.S.R. Battle port and mfg. city; pop. 57,100; ice-free artificial harbour; 4 153.

Lierre. Tn. of Belgium; silk-manufactures; pop. 29,193; town hall, 1 420 illus.

Lieutenant [lɪf'tənənt]. In Brit. army, commissioned officer next in rank below a captain.

Lieutenant, in Royal Navy, officer ranking next below lieutenant-commander; insignia, 5 351 illus.

Lieutenant-Colonel. In Brit. army, officer ranking next below a colonel.

Lieutenant-Commander. In Royal Navy, officer ranking immediately above lieutenant; insignia, 5 354.

Lieutenant-General. In Brit. army, officer ranking next below general.

Lieutenant, Naval Aviation. In Royal Navy; insignia, 5 351 illus.

Liège, R. of Belgium; Ghent on, 1 421 illus.

Life, biology the science of, 1 147; origin on earth, 3 119, 151, 152; evolution, 3 321; transmission of, 1 118.

Life Assurance, 4 271.

Lifeboat, 4-493; driven by hydraulic jets, 4 371; on passenger ship, 1 498, 501.

Life Guards. Regiment of Brit. army, one of the two regiments comprising the Household Cavalry; royal escort, 1 250.

Life-jackets, kapok filling in, 4-303.

Life-saving, 7 210.

Life-saving Rocket, types of apparatus, 6 122.

Liffey, R. of Irish Rep., 70-mile long stream rising S. of Dublin and flowing W. and N. in a sander into Dublin Bay, 4 381.

Lift Bridge, 2 68, 67 illus.

Lifts and Escalators, 4 495, 4 496 diag.; trucks, 2 11; canal lifts, 2 201, 206 illus.

Ligament. Connecting or binding tissue in the body.

Light, William (1784-1838). Brit. surveyor or genl. of S. Australia; served in Peninsular War; founded city of Adelaide, 1 18.

Light, 4 498 and colour, 2 462; corpuscular theory of, 4 500; electric light, 3 217; and sensitivity of eye, 3 331, 332; methods of generating, 4 501; bent by gravitation, 6 381; and microscopy, 5 196; Newton's discoveries in, 5 109, 7 128 illus. f.; optics, 5 522; photo-chemistry, 6 162; and plant life, 6 216; polarised light, 4-501, 7 228; measured by selenium cell, 6 530; from stars, 7-115; speed of, 6 380; speed of, and lenses, 4 480; and telescope, 7 218; wavelength of visible light, 3 221; wave motion and the ether, 3 301.

Light Brigade, cavalry formation; charge at Balaklava, 1 318.

Light Buoys, acetylene lighting, 1 10.

Lighthouses and Light Vessels, 4 502; oil lamps in, 4-413; pharos of Alexandria, 7 2; and Trinity House, 7 317, 318.

Lighting, by acetylene, 1 10; batteries, 1 386; coal gas, 3-505, 5 296; lamps, 4 112, 143; natural gas, 5 31; in London, 5 28; pressure lamps, 1-193.

Lightning, 4-504, 4-227.

Lightning Conductor, Franklin and, 4 505, 3 160.

Lightship, 4 501, 503 illus.

Light Sussex. Breed of poultry, 6-278, 277 illus. f.

Light Year, measure of distance in astronomy, 1-282; 4-498.

Lignin. See Liegnitz.

Lignin. Organic substance forming about 25 to 30 per cent. of wood, 7-313.

Lignite or Brown Coal, 2-427.

Lignum Vitae. Tree native to W. Indies. The timber, hard and heavy, is used for making bowls, ships' blocks, etc.

Ligny [lɪn'ɪ]. Vill. in Belgium 25 m. S.E. of Brussels; victory of Napoleon over Prussians under Blücher (1815) prelude to Waterloo, 1-494, 7-128.

LIGURIA

Liguria [lĭg'ŕiə]. In ancient Rom. days, that part of N. Italy which lay between the Po and the Mediterranean, and extended W. from the Gulf of Genoa to the Gaul border, or even at one time to the Rhone; also region of modern Italy; 2,000 sq. m.; pop. 1,536,000, 4-304.

Ligurian Republic. Name given to the republican govt. instituted in Genoa 1797 by Napoleon I.; incorporated in France 1805.

Ligurians. A pre-Roman and pre-Luscan people, organized in tribes, considered by some authorities the aboriginal inhabitants of N. Italy.

Li Hung-chang (lĭhŭngch'ang) (1823-1901). Chinese statesman; aided by Gordon's army, suppressed Taiping rebellion; bore chief burden of Sino-Japanese War; for many years "buffer" between China and outside world.

Lilac. Flowering deciduous shrub, 4-506.

Liliaceae [lĭl'i'as]. Plant family including lilies, tulip, Solomon's seal, Star of Bethlehem, butcher's broom, garlic, asparagus, and onions.

Liliales. Order including the *Liliaceae*, *Iridaceae*, and *Amaryllidaceae*.

Lilienthal [lĭl'i'entahl]. Otto (1848-96). German inventor; one of the early experimenters in aviation; attempted to imitate flight of birds, 4-33, 1-37.

Lille. Commercial and mfg. city of N. France; pop. 194,516; 4-506, 2-433.

Lillibulger lĭl'i'bŭl'jə. Satirical ballad sung to ancient tune by the Protestant party of Ireland during the Revolutionary period 1688; march of British commando units in 2nd World War.

Lilliputians. In Swift's *Gulliver's Travels*, tiny inhabitants of Lilliput, 7-205.

Lilly, John. See *Lyly, John*.

Lily. 4-506; section of bud, 3-401 illus.; bulb, 2-119; section of ovary, 3-395 diag.; resemblance of sepals to petals, 3-400.

Lilybaeum [lĭl'i'bæ'um]. Anc. city on promontory of Lilybaeum (Cape Boeo), W. extremity of Sicily, founded by Carthaginians; starting point of Roman military expeditions to Africa, modern Marsala; pop. 30,000; famous for wine.

Lily of the Nile. See *Arum Lily*.

Lily of the Valley, common garden plant (*Convallaria majalis*), also found wild in Britain; has drooping, fragrant white bell-like flowers, growing in clusters, 4-507.

Lima. Cap. of Peru; pop. 835,468, 4-507, 6-138; founded by Pizarro, 6-211; cathedral, 4-508 illus.; industries, 6-139, 141.

Liman von Sanders, Otto (1855-1929). Prussian soldier, in command of Turkish army which forced allies to evacuate Gallipoli peninsula 1915, 3-49; in 1918 in command of army in Palestine which was crushed by Gen. Allenby, 1-112.

Limavady [lĭmavə'di]. Tn. in co. Londonderry, N. Ireland; pop. 3,179, 8-34.

Limburger, type of soft cheese, 2-315. **Lime,** or quicklime (CaO). Calcium oxide used in preparation of mortars and cements, etc., 4-506, 1-112; in cement, 2-288, 1-189.

Lime. Citrus tree and fruit of the same name; not to be confused with the lime tree or linden, 4-509.

Lime. Tree, 4-509. **Lime, Slaked.** Calcium hydroxide, Ca(OH)₂; method of production, 4-508, 2-166.

Lime-burning, method of producing quicklime, 4-508.

Lime-light. Intense white light once used for stage lighting, 4-508.

Lime Mortar, production and uses, 4-508.

Lime Process, of soap making, 7-80. **Limerick.** Co. of Irish Rep., in prov. of Munster. Agricultural and pastoral land; milling and lace-making. Area 1,030 sq. m.; pop. 141,250. Co. tn. is Limerick.

Limerick. Co. tn. of co. Limerick, Irish Rep.; pop. 50,823, 4-284.

Limerick lace, 4-430 illus.

Limericks. Nonsense verses of five lines, 4-509; Lear and, 4-465.

Limestones. Sedimentary rock chiefly composed of calcium carbonate, 4-509, 5-81; in blast furnace, 4-293, 294; in cement mfr., 2-299; chalky forms, 2-299; from fossils, 3-425; lime from, 4-508; marble, 5-120; rock asphalt formation, 1-275; in slate-tile formation, 2-278.

Lime-wash. As coating for rough walls, 6-38.

Lime-water. A solution of calcium hydroxide in water, use, 4-508.

Lim Fjord. Sea-inlet stretching across the N. of Denmark; 100 m. long, 1 to 15 m. broad.

Liming, in mfr. of leather, 4-466.

Limitation, Statutes of. Laws in Eng. and U.S.A. by which right of bringing action is limited to a fixed period after occurrence of events giving rise to cause of action.

Limited Liability Company. A company having its members' liability limited to the amount which the members respectively guarantee to contribute to the company's assets should the company be wound up.

Limmat. R. of Switzerland; rises at N. end of Le Zürich, flows N.W. 18 m. to Aar r.; upper course called Linth.

Limoges [lĭm'ozh]. Tn. in W. cent. Fr. on r. Vienne; pop. 107,850; noted for porcelain and 16th cent. enamel work, 3-244.

Limon [lĭm'ŏn]. Chief apt. of Costa Rica, on a bay of the Caribbean; founded 1871; almost entire coffee and banana crops of Costa Rica exported from here; pop. 41,000, 2-515.

Limonite. Mineral; iron-ore in, 4-288. **Limpet.** Group of marine gastropod molluscs in which the shell is conical or tent-shaped, 5-232 illus. f., 7-24 illus. f.

Limpopo [lĭmp'ŏpŏ] or Crocodile River. In E. part of S. Africa; rises near Pretoria, forms N. boundary of Transvaal, then flows N.E. 1,000 m. through Mozambique into Indian Ocean, 7-88, 6-395.

Linaglia. See *Toadflax*.

Lincoln, Abraham (1809-65). 16th Pres. of U.S.A., 4-511, speech at Gettysburg, 3-70.

Lincoln. City and co. tn. of Lincs, Eng.; pop. 69,124-321; 513 illus.; cathedral, 8-252, 2-266 illus.

Lincoln. Cap. of state of Nebraska, U.S.A.; pop. 85,884, 5-360.

Lincoln College. Oxford Univ., 6-17.

Lincoln sheep, 7-22.

Lincolnshire. Second largest co. of Eng.; area 2,665 sq. m.; pop. 706,574; co. tn. is Lincoln, 4-512.

Lincolnshire Wolds. Eng. A range of hills in Lincolnshire extending from Spillby to Barton-on-Humber, 3-111.

Lincoln's Inn. London. Between Lincoln's Inn Fields and Chancery Lane; third of the London Inns of Court, dating back to 1312; the New Hall has a library containing over 70,000 books and manuscripts.

Lincoln's Inn Fields. London. A large square, adjoining Lincoln's Inn, with many old trees.

Lind, Jenny (1820-87). The "Swedish nightingale," famous and beloved soprano singer; toured Europe and U.S.A. and settled in London.

Lindbergh, Charles Augustus (b. 1902). Amer. airman, 4-513, 1-42.

Linden, another name for the lime tree. See *Lime* (tree).

Lindisfarne or Holy Island. Small isl. off coast of Northumberland, Eng.; St. Aidan and, 4-461; and foundation of Durham, 3-140.

Lindisfarne Gospels, manuscript, 5-116 illus. f.

Lindsay, Nicholas Vachel (1879-1931). Amer. poet, 7-366.

Lindsay, Norman (b. 1879). Australian artist and author, 1-321, 2-300.

LIPPE

Lindsey. One of the three parts into which Lincs, Eng., is divided; it is admin. from Lincoln, 4-512.

Linear. Bot. term given to a parallel-sided leaf, e.g. grass, 4-471.

Linear Accelerator, a forerunner of the cyclotron, 5-18.

Linen. Fabric manufactured from flax fibres, 4-514, 2-419; bleaching, 1-484; in N. Ireland, 5-485, 7-434 illus.; flax-growing, 3-387.

Line Regiments, of Brit. army, 1-248.

Lines of Force. Lines drawn in a graphical representation of a magnetic field so that their direction at any point is the direction of the magnetic field at that point. Density of lines of force is used as a measure of the magnetic force, the number of lines per square centimetre at any point being equal to the magnetic force at that point, 5-82; 5-84 diag. distortion in electric motor, 5-275.

Ling, Per Henrik (1776-1839). Swed. poet and dramatist; pioneer of physical education, 6-183.

Ling. See *Heather and Heath*.

Ling. Food fish of the cod family occurring in seas of N. Europe. Length up to 6 ft. Grey or black on back, greyish-white below.

Link. Brit. measure of length. The hundredth part of a chain, measuring 792 in.

Linklater, Eric (b. 1899). Brit. novelist; C.B.E. 1954; novels incl. *Juan in America*; *Poet's Pub*, *Private Angelo*; last two filmed, 6-514.

Linlithgow, Victor Alexander Hope, 2nd Marquess (1887-1952). Brit. administrator. Viceroy of India, 1936-43.

Linlithgow. Co. tn. of West Lothian Scot.; pop. 3,929, 5-39.

Linlithgow Loch. Lake in W. Lothian Scot.; area 102 acres, 5-40.

Linlithgowshire. Former name of West Lothian, Scot., 5-39.

Linnæan System of botanical classification, 4-515.

Linnæus, Carolus (Carl von Linné, 1707-78). Swedish botanist and naturalist 4-514; classification of plants and animals, 1-452, 1-155, and magnolia 5-86.

Linnæan Society. Brit. institution founded in 1788 "for the cultivation of the science of natural history in all its branches"; possesses the collections and library of Linnæus or Linné after whom it was named.

Linnæ, Bird. 4-515, 3-353; in moult-ing season, 1-469; nest, 1-459 illus.

Linnhe [lĭny]. Sea loch of Argyllshire and Inverness-shire Scot. Length, 304 m., greatest width 8 m.

Linoleum. Form of pictorial printing from linoleum blocks, 3-292, 4-516.

Linoleum and Oilcloth. Floor covering, 4-516.

"Linotype" in printing, 4-516, 7-340, compared with "Monotype," 5-246.

Lined, seed of flax plant, and linseed oil, 3-388.

Lined Oil, in putty and paints, 6-37.

Lintel. A piece of stone or timber placed horizontally over a doorway or window.

Linum. Genus of plants, family *Linacæe*; flax is an important member.

Lins [lĭnts]. Cap. and tourist centre of Upper Austria; makes tobacco products, arm implements, boats, cloth; pop. 181,500.

Lion. Animal of the cat family (*felidae*) 4-520, 4-519 illus., 1-61 illus.

Lion, Gulf of the. Wide bay of Mediterranean, washing most of S. coast of Fr.

Lions, Court of the. In the Alhambra Granada, 1-111, 110 illus. f.

Lipari [lĭp'arĭ] or *Æolian Islands*. It. group of volcanic isls. in Mediterranean, N. of Sicily; 45 sq. m. pop. 16,200; largest, Lipari; fruit olives, pumice-stone, alum, sulphur nitre; pumice exports, 6-303.

Lipoids. Organic fatty substances containing nitrogen and sometimes phosphorus.

Lippe [lĭp'ə]. Former principality and state in W. Ger.; 470 sq. m.; pop.

LIPPE

188,600; cap. Detmold, pop. 17,000; forests, in which beech predominates, cover 130 sq. m.; incorp. in N. Rhine-Westphalia in 1946.

L'ppe. Tributary of r. Rhine, flowing W. for about 150 m., 6-390.

Lippe-lippe, raft used by Australian blackfellows, 1-502.

Lipperheym, John Hans. Dutch spectacle maker; invented and constructed the first practical astronomical telescope, 1-280, 5-194.

Lippi (Lip'pé), Fra Filippino (1460-1504). Florentine painter, son of Fra Filippo Lippi and pupil of Botticelli; his work is more ornamental than his father's, more realistic and less poetical than Botticelli's, 4-317.

Lippi, Fra Filippo (c. 1406-69). Florentine painter, probably the greatest colourist of his day; his pictures reveal a strong, naive nature, with a lively and somewhat whimsical observation; pictures of the Madonna, 6-66, 4-318.

Lipton, Sir Thomas (1850-1931). Brit. merchant and yachtsman; at one time a small grocer in Scot., he developed his business into firm of Lipton, Ltd.; five times challenger for the America's Cup, but was unsuccessful, 7-511.

Liquid. A substance in a fluid state, 4-520; crystallisation of, 3-8; freezing, 3-465; friction caused by, 3-470; and soils, 2-455; and vapour, 3-510.

Liquid Air. Air is made liquid when its temp. is lowered under pressure to 312° below zero F.; it then resolves itself into its constituent elements.

Liquid Measure. See **Weights and Measures** (list).

Liquorice, 4-521.

Lira. It. money, 5-235 illus. See also **Money** (list).

Liriodendron. The tulip tree, *L. tulipifera*; native of U.S.A., where it reaches nearly 200 ft. in height; distinguished by its curious truncated leaves; has tulip-like yellow-green flowers; member of magnolia family, *Magnoliaceae*.

Lisbon. Cap. of Portugal; pop. 783,919; 4-521, 6-267; earthquake (1755), 3-153.

Lisle, Claude Joseph Rouget de. See **Rouget de Lisle**.

Lisle, twisted thread, origin of name, 4-506.

Lister, Joseph Lister, Baron (1827-1912). Brit. surgeon; discovered antiseptic methods of surgery, 4-522 7-194, 5-165, 1-176, 177.

Liston, Robert (1794-1847). Brit. surgeon; operation under general anaesthetic, 1-42.

List, Franz (1811-86). Hungarian musician and composer, 4-522, 4-206.

Literature. See **Language and Literature**.

Litharge. A lead compound used in making paints and flint glass, 4-463.

Lithgow, Tn. In N.S.W., Australia; pop. 13,360, 5-402.

Lithium. (Li). A soft white metallic element of the alkali metal group; atomic no. 3; atomic weight 6.94; found in small quantities in tobacco ash; 3-224; hydroxide and carbonate, 1-112.

Lithography, 4-523, 5-295.

Lithophone (Charlton white), as white pigment, 7-523.

Lithosphere. Rocky crust of the earth; composition, 8-150.

Lithuania S.S.R. Rep. of the U.S.S.R.; area 25,500 sq. m.; pop. 2,379,000; cap. Vilna, 4-523, 6-478; in 1st World War, 7-483; Memoi annexed by Ger., 7-486.

Litmus. Organic dye obtained from species of lichen. Paper impregnated with litmus is used by analyst to detect acids or alkalis in liquids, 1-12.

litre (liter). Unit in metric system of capacity equal to 1,000 c.c., the volume of 1 kg. of pure water (1 78 pint), 5-184.

LLOYD'S LIST

Little America. Byrd's base in the Antarctic, 2-147.

Little Auk. Bird; migration, 5-201 illus. f.

Little Bear (constellation). See **Ursa Minor**.

Little Belt. Strait between Finlen Isl. and mainland of Denmark; Swedish army under Charles X. marched across it on ice to Finlen in 1658; 1-357.

Little Bittern. Bird, 4-170, 1-477.

Little Dog (constellation). See **Canis Minor**.

Little Entente. A defensive alliance comprising Rumania, Yugoslavia, and Czechoslovakia after 1st World War; it proved ineffective against Hitler's territorial claims, 3-317.

Little Grebe. Bird, 4-69.

Little John. One of Robin Hood's men; How Little John Got His Name, 6-417.

Little Minch, Scot., Channel separating Skye from N. Uist; 14 to 20 m. wide.

Little Owl. Smallest Brit. owl, 6-12 with illus.

Little Rock, Arkansas, U.S.A. Cap. and largest city. bn Arkansas r.; pop. 101,000; iron and steel foundries; cotton seed mfrs., 1-239.

Little St. Bernard Pass. See **St. Bernard Pass**.

Little Sisters of the Poor. Founded in France in 1840, for relief and nursing of the aged and infirm poor.

Little Tern. Bird; migration, 5-201 illus. f.

Little Women. Book by Louisa M. Alcott, pub. 1868. Sequel, *Good Wives*, 1869, 1-97, 2-350.

Littoria. Name given 1931 to new prov. of Italy constituted out of parts of provs. of Rome and Frosinone, including the reclaimed Pontine Marshes; pop. 220,000. (Cap. Littoria, inaugurated in 1932; pop. 10,000. Both retained latins, 1915.

Littorio Bridge, connects Venice with the mainland, 7-387.

Litvaks. Rom. trumpet, 5-302.

Litvinov, Maxim (1876-1952). Russ. politician; member of central executive committee of Soviet Union; people's commissar for foreign affairs (1930-39); ambassador to U.S.A. (1941-43); dep. comm. foreign affairs (1943).

Liver. In human body, 4-524; secretion of bile, 4-27; in digestive system, 1-144; production of glucose, 4-36; and night-blindness, 3-334.

Liverpool, Robert Jenkinson, 2nd Earl of (1770-1828). British statesman; held the offices successively of foreign secretary, home secretary and secretary for war, and became prime minister on assassination of Duke of Portland in 1812.

Liverpool. City and Atlantic spt. In Lancashire on estuary of Mersey; pop. 789,532; 4-524, 4-441; radar installation; 6-339, 3-98 illus.; cathedral, 1-427, 2-264.

Liverpool, University of. Chartered 1903; as college 1881; part of Victoria Univ., Manchester 1881; besides the usual faculties it has depts. of engineering, commerce, and tropical medicine, famous school of architecture, and a valuable library, 4-525.

Liverpool and Manchester Railway, opening, 6-354 with illus.

Liverpool Mts. Range in E. of New South Wales, Australia; highest point, 4,500 ft.

Liverpool Street, London, E.C. Runs between Blomfield Street and Bishopsgate; here is a railway terminus, Liverpool Street, one of the busiest in the world, and adjoining, Broad Street station.

Liverwort. Flowerless plants related to mosses, 4-526, 6-214.

Livery Companies, 4-526.

Livingstone, David (1813-73). Scot. missionary explorer of Africa, 4-526; and Congo, 2-480; discovers Victoria Falls, 7-397; Stanley's search for, 7-145.

Livingstone Mts. Range in Tanganyika Territory, bordering N.E. shores of Lake Nyasa; highest point 9,600 ft.

Livius Andronicus, Lucius (c. 284-204 B.C.). (Gk. who became Roman playwright, 3-116; translated *Odyssey* into Latin, 4-449.

Livy (59 B.C.-A.D. 17). Anglicised name of Titus Livius, Rom. historian, 4-527, 4-451, 4-181.

Livorno. See **Leghorn**.

Lizard, The, or Lizard Head. A bold promontory of Cornwall; the most southerly point of Gt. Brit.; Lizard lighthouse, 4-502.

Lizard, José Joaquín Fernández de (1774-1827). S. Amer. novelist, 7-101.

Lizards. Scaly-bodied, four-legged reptiles, 4-528; and dragons, 3-112; foot, 3-413 illus.; compared with newt, 5-407; protective coloration, 6-298.

Ljubljana [lùbliàn'na], in German **Laibach.** City of Yugoslavia and cap. of federal region of Slovenia; old cath.; pop. 21,050; 7-518 with map; former cap. of Carniola.

Ljusne [lù'snæ] River, Sweden. Stream flowing 220 m. S.W. into Gulf of Bothnia.

Llama. S. Amer. animal of the camel family, 4-530, 6-143 illus., 7-100 illus.; alpaca compared with, 1-119; cloth from wool, 1-139.

Llanberis [lànber'is]. Village and tourist centre in Caernarvonshire, Wales; pop. 2,400, 7-78.

Llandaf [làn'daf]. Part of city of Cardiff, seat of anc. bishopric dating from 6th cent.; cathedral, 2-220.

Llandrindod Wells [làn'drind'od]. Inland health resort, Radnorshire, Wales; pop. 3,213; has mineral springs, 6-353.

Llandudno [làn'dud'nò]. Town and seaside resort in Caernarvonshire, Wales; pop. 16,712, 2-160.

Llanelli [làn'el'li]. Tn. in Carmarthenshire, Wales. Mfrs. steel and tinplate; pop. 34,329, 2-244.

Llanfair P.G. Village of Anglesey, Wales; longest name in Britain; name in full, 1-151.

Llangollen [làn'gòl'en], Wales. Tn. in Denbighshire on r. Dee; noted for scenery; brewing; trout and salmon fishing; pop. 3,275, 7-414 illus.

Llanos. Grassy plain country in S. Amer., 6-3, 6-187.

Llanwrtyd Wells [làn'wòr'tid]. Tn. in Breconshire, Wales; spa; weaving factory; pop. 560, 2-55.

Llewellyn [lù'el'lin]. Name of two princes of North Wales, Llewelyn I, the Great (reigned 1194-1230); and his grandson, Llewelyn (II) ap Gruffydd (reigned 1246-82), 2-161.

Llewellyn, Richard (pen name of Richard D. V. Llewellyn Lloyd), Anglo-Welsh writer; *How Green Was My Valley*, 7-115.

Lloyd, Edward (c. 1648-1712). Eng. proprietor of Lloyd's coffee house, London, a meeting place for men engaged in shipping and insurance; foundation of Lloyd's, 4-532.

Lloyd, (John) Selwyn (Brooke) (b. 1904). Brit. politician; min. of state 1951-54, min. of supply 1954-55; min. of defence 1955; foreign sec. 1955.

Lloyd Barrage. At Sukkur, Pak.; large irrigation dam, 4-259, 3-30 diag.

Lloyd-George, David Lloyd George, 1st Earl (1863-1945). Brit. statesman, 4-531, 7-351, 352.

Lloyd-George, Gwilym (b. 1894). Brit. politician, son of 1st Earl Lloyd-George; parl. sec. to Bd. of Trade 1931 and 1939-41; parl. sec. to min. of food 1941-49; min. of fuel and power 1942-45; min. of food 1951-54; home sec. from 1954.

Lloyd-George, Lady Megan. Brit. politician, younger daughter of 1st Earl Lloyd-George; represented Anglesey in parl. 1929-51.

Lloyd's. London assoc. for marine and miscellaneous insurance, 4-532; term A.I. 1-1, 4-271.

Lloyds Bank, 6-317.

Lloyd's List of shipping, founded 1734; second oldest Eng. paper, 4-633.

LLOYD'S REGISTER

Lloyd's Register of Shipping, and A.1 classification, 1, 1, 4-533.

Loach, A coarse fish, 6-404.

Load Line, See *Nautical Terms* (list).

Loam, A type of soil, 7-83.

Loanda [lon'da] or **Luanda** (São Paulo de Loanda), Cap. and chief spt. of Angola; pop. 23,000.

Loango [lōang'gō], Port of French Equatorial Africa, 100 m. N. of mouth of Congo river.

Lobachevsky, Nikolai Ivanovich (1793-1856), Russian mathematician. Founded a theory of non-Euclidean geometry, 5-149.

Lobar Pneumonia, Disease of the lungs, 5-52.

Lobbying, Term applied in Gt. Brit. and U.S.A. to activities of interested parties in influencing legislation; so-called from use of lobbies in Parliament or Congress for conferences with members.

Lobed Leaf, in botany, 4-470.

Lobe'lia, A genus of plants of the family *Campanulaceae*, having red, white, or blue flowers, with very irregular corolla; blue-flowered species popular as edging plant.

Lobengula (1833-94), King of the Matabeles, succeeding in 1870; sought and received Brit. protection, but his constant attacking of the Mashonas led to fighting with Gt. Brit. in 1893, and he was defeated in battle near Bulawayo.

Lobitos, Spt. of Peru on N.W. coast; oil centre, 6-141.

Lob Nor, Former inland sea, now a series of marshy lakes; and Tarim r., 1-286.

Lobodi, Highest peak of the Tien Shan Mts., 24,409 ft., 4-413.

Lobster, 4-533, 1-157 illus.

Lobworm, A very large earthworm; appears above ground in wet dewy grass in early morning.

Local Defence Volunteers, Name later changed to Home Guard, Britain's home defence force in 2nd World War, 7-488.

Local Government, in U.K., 4-52; careers in, 2-230.

Local Option, Right of local areas to settle own rules on certain matters especially licensing.

Local Time, 7-277.

Locarno, Treaty of (1925), 2-56, 2-300, 4-9, 3-317.

Loch, Name given to Scot. lakes, and to long narrow sea inlets.

Lochboisdale, Harbour on S. West. Outer Hebrides, Scot., 4-275.

Lochborail Head, Mt. in Seikirkshire, Scot., 3,025 ft., 6-531.

Lochindorb, Loch, Morayshire, Scot., 6-261.

Lochnagar, Mt., Scotland; 3,786 ft.; 1-5.

Loch Ranza, Beauty spot on Arran island, Buteshire, Scot.; herring fishing centre; 2-134.

Lochy, Loch, In Glen More, Invernessshire, Scot., 4-275, 6-511.

Lock, Artificial basin whereby vessels are taken to a higher or lower level, 2-204, 205; Panama Canal, 6-55, 56 illus.; dock gates, 3-97.

Locke, Bobby (b. 1917), S. African golfer; Brit. open champion 1949, 1950, 1952; 4-44.

Locke, John (1632-1704), Eng. philosopher and political economist, 4-584, 6-159 illus.

Locke, William John (1863-1930), Brit. novelist and playwright, native of Barbados (*The Beloved Faybairn*; *The Joyous Adventures of Aristide Fugot*).

Lockhart, John Gibson (1794-1854), Scot. writer, author of masterly biographies of Burns, Napoleon, and Scott; son-in-law of Sir Walter Scott; editor of *Quarterly Review* (1825-53); 6-514.

Lock-out, Closing of factories by employers in cases of dispute.

Locks, in justice, 4-385.

Locks and Keys, 4-534; ancient, 4-534 illus.; combination and time-locks, 6-488.

Lockyer Sir Joseph Norman (1836-1906), Brit. astronomer and physio-

ist; explained sunspots; between 1870 and 1905 conducted eight British expeditions for observing total solar eclipses; discovered helium in sun.

"Locomotion No. 1", Stephenson's locomotive, 7-155.

Locomotive, 5-1; vacuum brakes, 2-13 illus.; friction and wheel grip, 3-470; towing ships in Panama Canal, 6-56 illus.; railways, 6-334; Stephenson's locomotives, 7-155; Trevithick's, 7-316. See also *Railways*; *Steam Engine*.

Locomotive Engineering, as career, 2-238.

Locust, An insect, 5-14, 15 illus.; in Africa, 1-65; foot, 3-113 illus.; hearing organs, 4-264.

Locust Bean, Pod of the carob tree, *Ceratonia*, fam. *Leguminosae*, which is found in Mediterranean countries; used as a sugar food when ground into meal; is rich in carbohydrates and albuminoids.

Locust Tree, See *False Acacia*.

Lodestone, Magnetic oxide of iron; used in early magnetic experiments, 5-83.

Lodge, Sir Oliver Joseph (1831-1910), Brit. scientist, 5-14; and coherer, 6-341; and the tuned circuit, 6-313.

Lodge, Thomas (c. 1558-1625), Eng. writer and dramatist. Wrote *Rosalinde*, an arcadian romance, which story Shakespeare used as plot for *As You Like It*, 3-285.

Lodi [lō'dē], It. tn. 18 m. S.E. of Milan; pop. 24,000; scene of Fr. victory over Austrians (1796).

Lodz, Tn. in Poland; pop. 619,914; textile industry; 6-238, 239.

Loeb, Jacques (1859-1924), Ger.-Amer. biologist; fertilised sea-urchin eggs chemically ("artificial parthenogenesis"); developed theory that many so-called "intelligent" actions of animals are physical or chemical in nature ("tropisms").

Loeffler [lō'fēr], Friedrich (1852-1915), Ger. bacteriologist; in 1882 discovered bacillus of glanders, in 1881 that of diphtheria, named after him and his co-discoverer the Klebs-Loeffler bacillus.

Loess [lō'sē], Deposit of fine soil or loam, covering wide areas round margins of arid regions in Asia, swept there by winds. When irrigated makes fertile land.

Lofoten or Lofoden Islands, Group of rocky isls. off N.W. coast of Norway; mountainous; fishing industries; area 1,565 sq. m.; pop. 38,000.

Lofting, Hugh John (d. 1947), Author of children's books; after engineering work in Canada, Africa, and W. Indies, became famous for his "Dr. Doolittle" series; 2-351.

Lofly, Mt. S. Australia, height 2,231 ft., 7-102.

Log, Ship's. See *Ship's Log*.

Logan, Mt. Highest mt. in Canada, 19,539 ft., in S.W. corner of Yukon Territory; first climbed in 1925; 6-125, 5-452, 7-520.

Loganberry, Plant grown originally by Judge Logan (U.S.A.), who successfully crossed the raspberry and blackberry, 3-399.

Logarithms, 5-17; and arithmetic, 1-237; slide rule, 7-67. See also *Logarithms* (table).

Log-book, A ship's journal, 5-16; Nelson's, 5-364 illus.

Logic, Division of philosophy, 6-160.

Logwood (*Haematoxylon*), Tree of W. Indies and Cent. Amer. from 30 to 50 ft. high; so named from being shipped in logs; member of the *Laguminosae*, one of the hardest and most valuable woods; as dye, 3-141.

Lohengrin, In Ger. legend, a knight of King Arthur's court, 5-18; opera by Wagner, 6-517, 7-409.

Loing, Tributary of r. Seine, France, length 70 m.; canalised for much of its length, 6-530.

Loire, R. of Fr., 610 m. long, 5-18, 3-433; canal connexion with Rhône, 6-305.

Loire Inférieure, Dept. of Brittany, France, 2-91.

LONDON BRIDGE

Loiselsuria, Species of azalea, 1-330.

Loki [lō'kē], In Norse myth., mischief-making god; and Balder, 1-349.

Lolland, Danish isl., 3-72.

Lol'ards, Followers of Wycliffe, 7-505.

Lombard, Peter (c. 1100-60), Medieval philosopher and theologian, 6-186.

Lombards, Germanic tribe which settled in N. It., 5-19, 4-306; and banking, 1-363.

Lombard Street, London, E.C., Financial centre named after the Lombards, who settled thereabouts and carried on banking business, 1-363, 5-19.

Lombardy, District of N. Italy, 4-304.

Lombardy Poplar, Tapering form of the black poplar (*Populus nigra* var. *italica*); it grows fast, rising to well above 100 ft.; used for ornamental purposes, 6-259 illus.

Lombok, Isl. of Indonesia, just E. of Java; 3,136 sq. m.; exports rice, coffee, indigo, sugar.

Lombok Strait, Indonesia; Wallace's Line through, 1-265.

Lombroso [lōmb'rō'sō], Cesare (1836-1909), Famous It. criminologist, founder of science of criminal anthropology, originator of theory that there is a "criminal type," midway between the lunatic and the savage, marked by physical signs.

Lo'mond, Loch, Largest and most beautiful lake in Scot., in counties of Stirling and Dunbarton; 27 sq. m., length, 23 m.; 3-135, 6-510; and Lisbon earthquake, 3-153.

Lo'mond Hills, Kinrossshire, Scot.; West Lo'mond Hill (1,712 ft.) highest point, 4-412.

Lomonosov [lōmōn'sōf], Michael Vasilievich (1711-65), Rus. poet and philologist; established basic principle of latter-day Rus. language; first Rus. grammar, 6-180.

Londinium, The original London of Rom. times, 5-19; reconstruction of, 5-20 illus.

London, Jack (1876-1916), Amer. novelist, whose stories were largely drawn from his own adventurous career as sailor, tramp, stovetender, gold hunter, and war correspondent (*The Call of the Wild*; *People of the Abyss*; *White Fang*); 7-365.

London, Canada, commercial centre of W. Ontario, on r. Thames; pop. 95,343; rly. workshops, petroleum refineries; machinery, chemical works; 5-512, 2-195.

London, Cap. and chief spt. of Eng., admin. cap. of U.K. and of Brit. colonial empire. World's largest city; area (with suburbs) 700 sq. m.; pop. (admin. co. and City) 3,348,330; Greater London, 3,316,137; 5-19; map, 5-22; rebuilt by Alfred, 1-104 air raids, 5-28; post-war archaeo-logical work, 1-206; artesian wells, 1-255; aqueduct over r. Fleet, 7-424 illus.; Bank of England, 1-361; Battersea Power Stn., 4-150; Battle of Britain, 2-78; Brit. Museum, 2-88; Buckingham Palace, 2-101; buildings in Portland stone, 6-265; clubs, 2-424; Cockneys, 2-438; docks, 2-525, 3-97 illus.; Downing Street, 3-109; exhibitions, 3-328; fire brigade, 3-363; flying bomb attacks, 3-404, 7-196 illus.; Foch statue, 3-105; fogs, 3-105; Guildhall, 4-104 illus.; Horse Guards, 5-19; Livery companies, 4-326; old London bridge, 2-66; early meat market, 5-153; in Middle Ages, 3-277; National Gallery, 5-327; Houses of Parliament, 6-87, 89 illus.; Metropolitan police, 3-243; rainfall, 6-361; St. Paul's cath., 6-487; public services under the streets, 6-406 diag.; Thames, 7-261, 262 illus.; the Tower, 7-301, 302 illus.; transport, 6-412; water supply in anc. times, 7-425, 424 illus.; Westminster Abbey, 7-442.

London, University of, 5-33, 5-28.

London Airport, Heathrow, Middlesex, 14 m. W. of London; opened 1946; chief runways 5,000 ft., 1-86, 5-27.

London and North-Eastern Railway, Former rly. co. of the U.K., 6-356.

London Bridge, 5-20.

TABLE OF COMMON LOGARITHMS

	0	1	2	3	4	5	6	7	8	9	D		0	1	2	3	4	5	6	7	8	9	D
10	0000	0043	0086	0128	0170	0212	0253	0294	0334	0374	42	55	7404	7412	7419	7427	7435	7443	7451	7459	7466	7474	8
11	0414	0453	0492	0531	0569	0607	0645	0682	0719	0755	38	56	7482	7490	7497	7505	7513	7520	7528	7536	7544	7551	8
12	0792	0828	0864	0899	0934	0969	1004	1038	1072	1106	35	57	7550	7566	7574	7582	7590	7597	7604	7612	7619	7627	8
13	1139	1173	1206	1239	1271	1303	1335	1367	1399	1430	32	58	7634	7642	7649	7657	7664	7672	7679	7686	7694	7701	7
14	1461	1492	1523	1553	1584	1614	1644	1673	1703	1732	30	59	7700	7716	7723	7731	7738	7745	7752	7760	7767	7774	7
15	1761	1790	1818	1847	1875	1903	1931	1959	1987	2014	28	60	7782	7789	7796	7803	7810	7818	7825	7832	7839	7846	7
16	2041	2068	2095	2122	2148	2175	2201	2227	2253	2279	26	61	7853	7860	7868	7875	7882	7889	7896	7903	7910	7917	7
17	2304	2330	2355	2380	2405	2430	2455	2480	2504	2529	25	62	7924	7931	7938	7945	7952	7959	7966	7973	7980	7987	7
18	2553	2577	2601	2625	2648	2672	2695	2718	2742	2765	24	63	7993	8000	8007	8014	8021	8028	8035	8041	8048	8055	7
19	2788	2810	2833	2856	2878	2900	2923	2945	2967	2989	22	64	8062	8069	8075	8082	8089	8096	8102	8109	8116	8122	7
20	3010	3032	3054	3075	3096	3118	3139	3160	3181	3201	21	65	8129	8136	8142	8149	8156	8162	8169	8176	8182	8189	7
21	3222	3243	3263	3284	3304	3324	3345	3365	3385	3405	20	66	8195	8202	8209	8215	8222	8228	8235	8241	8248	8254	7
22	3424	3444	3464	3483	3502	3522	3541	3560	3579	3598	19	67	8261	8267	8274	8280	8287	8292	8299	8306	8312	8319	6
23	3617	3636	3656	3674	3692	3711	3729	3747	3766	3784	18	68	8325	8331	8338	8344	8351	8357	8363	8370	8376	8382	6
24	3802	3820	3838	3856	3874	3892	3909	3927	3945	3962	18	69	8388	8395	8401	8407	8414	8420	8426	8432	8439	8445	6
25	3970	3997	4014	4031	4048	4065	4082	4099	4116	4133	17	70	8451	8457	8463	8470	8476	8482	8488	8494	8500	8506	6
26	4150	4166	4183	4200	4216	4232	4249	4265	4281	4298	16	71	8513	8519	8525	8531	8537	8543	8549	8555	8561	8567	6
27	4314	4330	4346	4362	4378	4393	4409	4425	4440	4456	16	72	8573	8579	8585	8591	8597	8603	8609	8615	8621	8627	6
28	4472	4487	4502	4518	4533	4548	4563	4579	4594	4609	15	73	8633	8639	8645	8651	8657	8663	8669	8675	8681	8686	6
29	4624	4639	4654	4669	4683	4698	4713	4728	4742	4757	15	74	8692	8698	8704	8710	8716	8722	8727	8733	8739	8745	6
30	4771	4786	4800	4814	4829	4843	4857	4871	4886	4900	14	75	8751	8756	8762	8768	8774	8779	8785	8791	8797	8802	6
31	4914	4928	4942	4955	4969	4983	4997	5011	5024	5038	14	76	8808	8814	8820	8825	8831	8837	8842	8848	8854	8860	6
32	5051	5065	5079	5092	5105	5119	5132	5145	5159	5172	13	77	8865	8871	8876	8882	8887	8893	8899	8904	8910	8915	6
33	5185	5198	5211	5224	5237	5250	5263	5276	5289	5302	13	78	8921	8927	8932	8938	8943	8949	8954	8960	8965	8971	6
34	5315	5328	5340	5353	5366	5378	5391	5403	5416	5428	13	79	8976	8982	8987	8993	8998	9004	9009	9015	9020	9025	5
35	5441	5453	5465	5478	5490	5502	5514	5527	5539	5551	12	80	9031	9036	9042	9047	9053	9058	9063	9069	9074	9079	5
36	5563	5575	5587	5599	5611	5623	5635	5647	5658	5670	12	81	9085	9090	9096	9101	9106	9112	9117	9122	9128	9133	5
37	5682	5694	5705	5717	5729	5740	5752	5763	5775	5786	12	82	9138	9143	9149	9154	9159	9165	9170	9175	9180	9186	5
38	5798	5809	5821	5832	5843	5854	5865	5877	5888	5899	11	83	9191	9196	9201	9206	9212	9217	9222	9227	9232	9238	5
39	5911	5922	5933	5944	5955	5966	5977	5988	5999	6010	11	84	9243	9248	9253	9258	9263	9269	9274	9279	9284	9289	5
40	6021	6031	6042	6053	6063	6073	6083	6093	6107	6117	11	85	9294	9299	9304	9309	9315	9320	9325	9330	9335	9340	5
41	6128	6138	6149	6160	6170	6180	6191	6201	6212	6222	10	86	9345	9350	9355	9360	9365	9370	9375	9380	9385	9390	5
42	6232	6243	6253	6263	6274	6284	6294	6304	6314	6325	10	87	9395	9400	9405	9410	9415	9420	9425	9430	9435	9440	5
43	6335	6345	6355	6365	6375	6385	6395	6405	6415	6425	10	88	9445	9450	9455	9460	9465	9469	9474	9479	9484	9489	5
44	6435	6441	6454	6464	6474	6484	6493	6503	6513	6522	10	89	9494	9499	9504	9509	9513	9518	9523	9528	9533	9538	5
45	6532	6542	6551	6561	6571	6580	6590	6600	6609	6618	10	90	9542	9547	9552	9557	9562	9566	9571	9576	9581	9586	5
46	6628	6637	6646	6656	6665	6675	6684	6693	6702	6712	9	91	9590	9595	9600	9605	9609	9614	9619	9624	9628	9633	5
47	6721	6730	6739	6749	6758	6767	6776	6785	6794	6803	9	92	9608	9613	9617	9622	9627	9631	9636	9641	9645	9650	5
48	6812	6821	6830	6839	6848	6857	6866	6875	6884	6893	9	93	9645	9649	9654	9659	9663	9668	9673	9677	9682	9687	5
49	6902	6911	6920	6928	6937	6946	6955	6964	6972	6981	9	94	9731	9736	9741	9745	9750	9754	9759	9763	9768	9773	5
50	6990	6998	7007	7016	7024	7033	7042	7050	7059	7067	9	95	9777	9782	9786	9791	9795	9800	9805	9809	9814	9818	5
51	7076	7084	7093	7101	7110	7118	7126	7135	7143	7152	8	96	9823	9827	9832	9836	9841	9845	9850	9854	9859	9863	5
52	7160	7168	7177	7185	7193	7202	7210	7218	7226	7235	8	97	9868	9872	9877	9881	9886	9890	9894	9899	9903	9908	4
53	7243	7251	7259	7267	7275	7284	7292	7300	7308	7316	8	98	9912	9917	9921	9926	9930	9934	9939	9943	9948	9952	4
54	7324	7332	7340	7348	7356	7364	7372	7380	7388	7396	8	99	9956	9961	9965	9969	9974	9978	9983	9987	9991	9996	4

Those unfamiliar with logarithms should read the general principles, especially about the mantissa and characteristic, in the article on Logarithms before using this table.

Finding logarithms of numbers. Locate the first two figures in the left-hand column and the third in the top row. The corresponding four numbers in the table are the mantissa (mantissa of 151 is 1790). The characteristic is one less than the number of digits to the left of the decimal point. Thus the logarithm of 1.51 (usually written log 1.51) = 0.1790; log 15.1 = 1.1790; log 151 = 2.1790; and so on.

For decimal fractions, the characteristic is one greater than the number of zeros between the decimal point and the first significant digit, and has a negative sign above the characteristic, with the mantissa in the table (log 0.151 = $\bar{1}$.1790; log 0.0151 = $\bar{2}$.1790; and so on).

To find the logarithm of a number having four significant digits proceed by interpolation as follows: obtain the difference between the mantissas for the next smaller and next larger three-digit numbers. multiply this by the last digit of your number, divide by 10, and add the result to the logarithm for the first three digits of the number. Thus, to find log 15.13. log 15.2 (=1.1818) - log 15.1 (= 1.1790) = .0028. $.3 \times .0028 = .00084$. Adding: 1.1790 + .00084 = 1.17984 (= log 15.13). The column marked D at the right gives the average value for the difference between any two mantissas on the line, and may

be used (remembering to multiply, then divide by 10 as above) if less accurate results will suffice.

To find a number from its logarithm. Locate in the table the mantissa next below the one you have, write the three corresponding digits from the side column and the top row and put in the decimal point as the characteristic requires. For remaining digits, reverse the interpolation process given above. Thus, to find the number for the logarithm 1.17984. The next lowest mantissa is 1790, and the number (with decimal point inserted for characteristic 1) is 15.1. The difference between mantissas, .1790 and .1818 is .0028. Divide by the difference

.0028
you have $\bar{1} - \bar{2} = -3$. Adding this after 15.1 (not to it) gives
15.13(3), the answer.

Computing with logarithms. When all characteristics are positive, the computations proceed as explained in the article on Logarithms. When negative characteristics appear treat the characteristics and mantissas separately, and at the end combine any characteristic resulting from the mantissas with the others. Thus, to find $\log 151 \times 0.151$. To log 151 (= 2.1790) add log 0.151 (= $\bar{1}$.1790). Result: 1.3580 (= log of 22.8 approx.). To divide 0.151 by 151: from log 0.151 (= $\bar{1}$.1790) subtract log 151 (= 2.1790). Result $\bar{3}$.000 (= log of .001). To find the 7th power of 0.151: multiply log 0.151 (= $\bar{1}$.1790) by 7. Answer: $\bar{7}$ + (7 + .1790) = $\bar{7}$ + 1.2580 = $\bar{6}$.2580 (= log of 0.0000179 approx. (See also Logarithms).

LONDON COMPANY

London Company. Corporation chartered 1606 for purpose of founding colonies in America.

London County Council (L.C.C.). Governing council of the co. of London, instituted in 1888 on the formation of the co.; County Hall, its headquarters, is opposite New Scotland Yd., on the S. side of the Thames; 5-24 illus., 4-52 illus.

Londonderry. Co. of N. Ireland; area 816 sq. m.; pop. 155,520; co. tn. is Londonderry; 5-33.

Londonderry. Co. tn. of co. Londonderry, N. Ireland; (usually called Derry) pop. 50,000; 5-34, 5-458.

Lon'donderry, 2nd Marquess of. See Castlereagh.

Londonderry Air. Irish folk tune, 5-34.

London Gazette. First appeared in 1866. Records appointments, promotions in the armed forces; court announcements; honours, decorations.

London Group. Group of British painters evolved in 1914 from Sickert's Camden Town School (1911); Spencer Gore and Charles Ginner prominent members. About 1918 Duncan Grant, Vanessa Bell, and others introduced post-impressionist element.

London, Midland, and Scottish Railway. Former rly. co. of Gt. Brit., 6-356.

London Museum. Institution founded in 1911 to commemorate the coronation of George V., 5-27, 5-300.

London Pride (*Saxifraga umbrosa*). A species of saxifrage, 6-501, 4-471 illus.

London School of Economics. School of London Univ., founded 1895, 5-33.

London Transport. An organization including the Underground railways, trolley-bus, omnibus and Green Line coach services in the London area; began as London Passenger Transport Board (L.P.T.B.) in 1933; nationalised (1947) under the London Transport Executive; 1-218.

London Wall. A London thoroughfare, running W. from Old Broad Street to the N. Wood Street along line of former city wall; wall originally built in the 2nd century and rebuilt in the Middle Ages; Rom. remains are still to be seen.

Long, Crawford Williamson (1815-78). American surgeon, performed first recorded surgical operation using an anaesthetic, 1-142.

Long, Loch. Inlet, Scot., branch of Firth of Clyde, 17 m. long, 3-135, 134 illus.

Long Beach, California, U.S.A. Seaside resort and industrial centre on S. coast, about 20 m. S. of Los Angeles; resident pop. 250,767; shipbuilding.

Longbow. Weapon, 1-206; influence on warfare, 4-418; displaced by gunpowder, 6-454.

Longbridge, Birmingham, Eng.; Austin car works, 1-311.

Long-case Clock. See Grandfather Clocks.

Longchamps Racecourse, Paris. 6-79.

Long-distance Transmission. wave-lengths, 6-314.

Long Division. in arithmetic, 3-96.

Long-eared Owl. 6-12.

Longfellow, Henry Wadsworth (1807-82). Amer. poet, 5-34, 7-364.

Longford. Co. in Irish Rep., in prov. of Leinster; area 403 sq. m.; pop. 34,567; livestock and dairy farming.

Long Island, New York, U.S.A. Isl. N. of Connecticut, forming S.E. portion of N.Y. state; 1,682 sq. m.; contains Brooklyn and Long Island City, 5-421.

Longitude. 5-339. See also Latitude and Longitude.

Longest. Eng. country mansion near Westminster, Wilt., 1-212 illus.

Long Measure. linear measure or measure of length. See Weights and Measures (list).

Long Parliament. In Eng. hist.; and Charles I., 2-307, 3-278.

"Longshanks," nickname of Edward I of Eng.

Longships Lighthouse, Land's End, Eng. 4-502.

Long Sight. and shape of eyeball, 3-353 with diag.

Long-tailed Tit. Bird; nest, 1-459 illus.

Longton. Part of the city of Stoke-on-Trent, Staffs, Eng., 7-141.

Long Ton. See Weights (list).

Longus (c. 3rd cent. A.D.). Gk. writer, author of famous romance *Daphnis and Chloe*, 4-84.

Longwall System. of coal mining, 2-439 with diag.

Long Waves. in radio, 6-345.

Lonsdale, Frederick (1881-1954). Brit. dramatist; author of modern comedies (*Aren't We All?*; *The Last of Mrs. Cheyne*).

Lonsdale, Hugh Cecil Lowther, 5th Earl of (1857-1944). Brit. sportsman, famous for his patronage of horse-racing, boxing, and other sports; instituted Lonsdale Belt for Brit. boxing champions.

Looshee Islands. See Ryukyu.

Loofah. Dried framework of cucumber-like fruit of an African plant 7-138.

Loom. Machine for weaving cloth, 5-36; for carpet-making, 2-246; Jacquard loom, 4-335; tapestry weaving, 7-224, 226; weaving, 7-433, 434 illus.

Loon. Scot. name for the Great Northern diver. See Diver.

Loosestrife. Leafy-stemmed perennial herb embracing the genus *Lythrum* of the primrose family; common loosestrife is *L. vulgaris*, a tall coarse plant with large yellow flowers in terminal leafy panicles; *L. nummularia* (moneywort), or creeping jenny, is a trailing plant with small yellow flowers often found on the banks of streams; purple loosestrife (*Lythrum salicaria*) is no relation to the other species.

Lop-eared Rabbit. 6-328, 327 illus.

Lope de Vega. See Vega Carpio.

Lopez (16th pers.), Carlos Antonio (1790-1862). Dictator of Paraguay.

Lopez, Francisco Solano (1826-70). Dictator of Paraguay, 2-49.

Lopez de Legaspi, Miguel (1524-72). Sp. soldier and navigator, conqueror of Philippines; founder of Manila.

Lopez de Santa Anna, General Antonio (1795-1876). Mexican soldier. Became president in 1833; overthrown by an insurrection and banished 1845. Again president 1816; disappeared in 1817 after defeat of Mexico by U.S.; third term as president 1853-55, 5-188.

Lopez de Segura, Ruy (16th cent.). Span. chess player, 2-328.

Lopez de Villalobos, Ruy (1500-41). Span. navigator; expedition to Philippines, 6-157.

Lopokova, Lydia (b. 1892). Russian dancer of Diaghilev ballet company, leading parts in *La Boutique Fantasque* and *The Good-humoured Ladies*; mar. (1925) J. M. (Lord) Keynes.

Loquat. Type of fruit, 3-479.

Lorea. Anc. city in S.E. Spain on r. San-gonera; pop. 70,000; trade centre; scene of many battles between Christians and Moors.

Lorta, Federico Garcia (c. 1898-1936). Sp. poet and dramatist; his poems influenced the Sp. revolutionary movement; in 1936 assassinated by Fascists at Granada; poems, "Romancero Gitano," "El Poeta en Nueva York"; tragedy *Bozas de Sangre* (trs. into Eng. as *Blood Wedding*); 7-1, 2.

Lord. A Brit. title borne by marquesses, earls, viscounts, and barons; also borne as courtesy title by eldest sons of dukes, marquesses, and earls, and younger sons of dukes and marquesses; as title of office borne by lord chancellor, lord mayors, etc.

Lord Advocate. Chief law officer of Crown, in Scotland.

Lord Chamberlain. The title given to an officer of the British royal household, who is second dignitary of the court; he is in charge of all the household above stairs, and the symbols of his office are a white staff and a key.

Lord Chamberlain's Men. Elizabethan company of actors, 3-115.

Lord Chancellor. The title (in full Lord High Chancellor) given to the

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highest judicial functionary of Gr. Brit.; he relinquishes his appointment when a new government comes into power; he is keeper of the Great Seal, a cabinet minister, and a privy councillor; he also presides over the House of Lords, and appoints county court judges and J.P.s; 2-322.

Lord Chief Justice. second highest title in the Supreme Court of Judicature of Eng. and Wales; 2-321; taking oath, 4-458 illus.

Lord High Admiral. title obsolete since 1828.

Lord Mayor. Chief magistrate in English cities, which, at end of 1963, were London, Birmingham, Bradford, Bristol, Coventry, Hull, Leeds, Leicester, Liverpool, Manchester, Newcastle, Norwich, Nottingham, Plymouth, Portsmouth, Sheffield, Stoke-on-Trent, York; in connexion with the appointment of the Lord Mayor of London an annual procession, begun in 1215, takes place on Nov. 9; Lord Mayor's banquet, 5-20, 5-152 illus.

Lord of Mirale, at Christmas revels, 2-381.

Lord Protector. Cromwell's title during period of the Commonwealth, 2-534.

Lords, House of. Upper house of U.K. parliament, 4-50, 6-87; duties and rights of, 6-106; court of appeal, 2-521; decreased power of, 6-88.

Lords and Ladies. See Wild Arum.

Lord's Cricket Ground. St. John's Wood, London, 2-528.

Lords' Spiritual, in House of Lords. 6-106.

Lord's Supper. See Eucharist.

Lord Steward. Title in the U.K. of the first dignitary of the court, an official of the royal household; receives his office from the sovereign personally, and is a peer, privy councillor, and member of the ministry; directs all the household below stairs, and has authority over all royal officers and servants other than those connected with the chamber, the chapel, and the stable.

Lord Warden of the Cinque Ports. 2-102.

Loredano, Leonardo. Doge of Venice; portrait by Bellini, 4-326.

Lorelei (lôrelî). Fabled Rhine siren, said to lure boatmen to destruction; legend probably from echoing rock of that name in the Rhine, 6-391.

Lorentz Transformation. and relativity, 6-380.

Lorenzo de' Medici. See Medici, Lorenzo de'.

Loret to School. Boys' public school at Loretto, Scot., about 6 m. from Edinburgh.

Lorient (lôrôhn'). France. Fortified naval port in Morbihan prov.; pop. 11,838; shipyards, arsenal; fisheries; German U-boat base 1940-45, heavily bombed by R.A.F.

Loris. Type of lemur; small with little or no tail, varies in size from 8 ins. to size of a cat. Eyes round and conspicuous like those of an owl, 4-478.

Lorne, Marquess of (J. D. S. Campbell). See Argyll, 9th Duke of.

Lorrain, Claude. See Claude Lorrain.

Lorraine, France. See Alsace-Lorraine.

Lory. Species of parrot having a peculiar extensible tongue, 6-92.

Los Alamos, California, U.S.A.; atomic plant at, 1-202, 303.

Los Angeles, California, U.S.A.; pop. 1,957,692; 5-38, 3-426, 2-177.

Loosie. R. of Scot.; salmon fishing, 5-261.

Lossiemouth. Tn. in Morayshire, Scot.; pop. 5,596, 5-61, 5-261.

Lot. Biblical character; and Abraham, 1-5; Lot's wife, 3-56.

Lothair I (795-855). Holy Roman emperor, grandson of Charlemagne; became joint ruler 817 when Louis I. his father, divided the Empire among his sons; after some years of strife with his brothers received Italy and imperial title together with lands along Rhine and Rhône (partition of Verdun, 843).

Lothair II, the Saxon (c. 1070-1137). Holy Roman emperor 1133-37, created Duke of Saxony in 1106, and

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elected Ger. king in 1125; a strong, capable ruler, whose reign was regarded as a golden age for Germany.

Lothair (825-869). King of Lorraine, son of Lothair I; received as his kingdom dist. w. of Rhine between North Sea and Jura Mts., called after him Lotharingia or Lorraine (Ger. Lothringen).

Lotharingia. Kingdom of Lothair, 1-417, 4-6.

Lothians. Scot. co., 5-39. *See* East Lothian; Midlothian; West Lothian.

Lot (1878). Pierre. Pen-name of Louis Marie Julien Viaud (1870-1923). Fr. novelist; exquisite stylist; chief works, *Pêcheur d'Islande* (*The Island Fisherman*), *Madame Chrysanthème*, and *Mon Frère Yves*.

Lotte, Lorenzo. Italian painter, pupil of Vivarini, and probably a native of Venice; portrait of Columbus, 2-467.

Lotus. Flower of the water-lily family, 5-40, 7-128.

Lotze (lot'sel), Rudolf Hermann (1817-81). Ger. philosopher; opposed theory of vital force and was a founder and developer of physiological psychology, 6-160.

Loubet (loo'bè), Emile (1838-1929). Fr. statesman, 7th pres. of Fr. Republic (1898-1906); remitted Dreyfus's sentence.

Loudspeaker. 6-340 illus. f.

Loughborough. Tn. in Leics, Eng.; pop. 34,731; colleges and bell foundries, 4-476.

Louis, St. *See* Louis IX (of France).

Louis I, the Pious (778-840). Holy Rom. emperor and king of France; the youngest son of Charlemagne, 5-40.

Louis II (c. 822-75). Napoleon (crowned 850) and king of Italy (succeeded 839), son of Lothair I; fought Saracens and restored order in Italy.

Louis III, the Blind (880-928). Emperor (crowned 901) and king of the Lombards (chosen 900), grandson of Louis II; his eyes were put out 905 by Berengar, rival king of the Lombards; thereafter lived in exile in Provence.

Louis IV, the Bavarian (about 1287-1347). Emperor (crowned 1293) and king of Germany (elected 1314); warred with Pope; added to possessions.

Louis, the German (804-76). King of the East Franks; 3rd son of Louis the Pious and grandson of Charlemagne; his share of Charlemagne's empire after partition of Verdun (843) formed nucleus of modern Ger. Louis, Kings of France, 5-40.

Louis VII (reigned 1137-80). King of France, 5-40; second Crusade, 3-2.

Louis IX, St. Louis (b. 1214; reigned 1226-70). King of Fr., 5-41, 3-450; Crusades, 3-2.

Louis XI (reigned 1461-83). King of Fr., 5-41, 2-309, 3-314.

Louis XII (b. 1462; reigned 1498-1515). King of Fr., 5-41; attack on Venetian republic, 4-314.

Louis XIII (b. 1601; reigned 1610-43). King of Fr., 5-41; and Richelieu, 3-460, 6-400; dismissal of States-General, 3-467.

Louis XIV (b. 1638; reigned 1643-1715). King of Fr., 5-43, 2-451; patronage of arts, 3-439; buttons, 4-373; and Charles II, 2-308, 3-280; revocation of Edict of Nantes, 4-202; and flying machines, 1-27; attempt to gain it. from Sp., 4-314; and James II, 4-340; Louisiana named after, 5-45; and Mazarin, 5-151; and William III, 7-452; palace of Versailles, 7-394.

Louis XV (b. 1710; reigned 1715-74). King of Fr., 5-43, 3-451; and Petit Trianon, 7-394.

Louis XVI (b. 1754; reigned 1774-92). King of Fr., 5-43, 3-451; and Fr. Revolution, 3-467, 4-68; and Lafayette, 4-437; and Mirabeau, 5-224; and Marie Antoinette, 5-156.

Louis XVII (1785-1795). Son of Louis XVI, King of France; never actually reigned; presumably died in prison 1795, 5-43, 5-126.

Louis I (1838-89). King of Portugal; succeeded in 1861; abolished slavery in Port. colonies.

Louis, Joe (J. L. Barrow, b. 1914). Amer. Negro boxer; world heavyweight champion 1937 to his retirement 1940; defended title over 30 times.

Louisburg. Shipping port and fishing village on Cape Breton Isl., Nova Scotia; pop. 1,120; important fortress under French; 5-470.

Louise (1776-1810). Queen of Frederick William III of Prussia; her beauty, goodness, and fortitude in misfortune made her a German heroine; Napoleon's rudeness to her after Eylau and Friedland hardened resolve of her son William I to humiliate France after Sedan.

Louise. Opera by Charpentier; story, 6-517.

Louise, Lake, Alberta. In Rocky Mts. Park, it lies 3,800 ft. above sea level at foot of M. Victoria.

Localade (loo'dahd'). Archipelago. Group of islands off s.e. coast of New Guinea, belonging to Papua.

Louisiana (loo'zee-shah-nä). State of U.S.A., area 48,523 sq. m.; pop. 2,633,516; cap. Baton Rouge; 5-44, 1-136.

Louisiana Purchase. Extensive area of land in N. Amer. purchased by U.S.A. govt. from Napoleon in 1803; 4-358, 5-323.

Louis Napoleon. *See* Napoleon III.

Louis Philippe (b. 1773; reigned 1830-48). King of Fr., 5-44, 2-453, 2-28; Lafayette and revolution of 1830, 4-431.

Louisville. Tn. in Kentucky, U.S.A.; pop. 389,129; centre of tobacco industry, 4-399.

Lourdes. Tn. of Fr., in dept. of Hautes-Pyrénées, pop. 13,990. Noted for pilgrimages of sick people to the grotto of Our Lady of Lourdes, 6-314.

Lourenço Marques. Cap. of Mozambique, Port. colony in s.e. Africa; pop. 69,800; origin of name, 3-65.

Louse. A wingless, parasitic insect; two sub-orders, *Mallophaga*, biting lice, and *Siphunculata*, sucking lice; the species parasitic on Man is *Pediculus humanus*; egg of head louse, 3-171 diag.

Louth. Smallest co. of Irish Rep.; area 317 sq. m.; pop. 68,747; chief industries agriculture and fishing; lead is mined. Co. tn. Dundalk.

Louvain. Tn. in Belgium; pop. 36,884; 5-45.

Louvain, University of, at Louvain. Belgium, founded 1225; leading scientific institution of medieval Europe, having 6,000 students in 18th cent.; active in Counter Reformation; suppressed during Fr. Rev., re-established in 1817; library destroyed in both World Wars.

Louvois (loo'wah'), François Michel Le Tellier, Marquis de (1641-91). Fr. statesman, Louis XIV's war minister; wasted prosperity of Fr. and destroyed peace of Europe for military "glory."

Louvre. In architecture a lantern or open turret on the roof of a building; also applied to a type of shutter with sloping, overlapping surfaces.

Louvre, The. Art museum in Paris, 5-45.

Lovat (luv'at'), Simon Fraser, 11th Lord (c. 1687-1747). Scot. Jacobite intriguer; outlawed for forcing the Dowager Lady Lovat to marry him, he fled to Fr.; returning to Eng. he supported the govt. in the Jacobite rising of 1715, but went over to the Jacobites in the rising of 1745 and was taken prisoner after Culloden and executed.

Lovat, Simon Joseph Fraser, 14th Baron (1871-1933). Brit. soldier; raised the volunteer cavalry regiment known as Lovat's Scouts in Boer War.

Love-apple. Old name for tomato, 7-290.

Love-bird. Variety of short-tailed African parrot, 6-93.

Lovelace, Richard (1618-58). Eng. Cavalier poet, immortalised by two

LUCIAN

lyrics ("To Lucretia, on (going to the Wars"; "To Althea, from Prison"); 3-285.

Lover, Samuel (1797-1868). Irish novelist and poet; *Handy Andy*, a roaring farce dealing with an Irish servant lad's buffoonery; *Rory O'More*, with its brave, good-natured, peasant hero, equally popular as novel and play.

Low, David (b. 1891). Brit. cartoonist; a New Zealander, he contributed to the London *Star*, *Evening Standard* (1927-50), *Daily Herald*, and (from 1953) *Manchester Guardian*; a brilliant draughtsman, he created a number of satirical characters, e.g. "Colonel Blimp."

Low Countries. Eng. equivalent of "Netherlands," formerly applied to Belgium, Holland, and Luxemburg.

Lowell, James Russell (1819-91). Amer. poet and critic, 7-361.

Lowell, Percival (1855-1916). Amer. astronomer; lived in Japan (1883-93); established Lowell Observatory at Flagstaff, Ariz., and Marz., 6-212.

Lowell, Massachusetts. U.S.A. (great textile mfg. centre; pop. 97,249; mfrs. textiles, boots and shoes, 6-145).

Lower Canada. Former name of Ontario prov., Canada, 4-321.

Lower Saxony. Land of W. Ger., consisting of the former states of Hanover, Oldenburg, and Brunswick; pop. 6,795,379; area 17,116 sq. m.; cap. Hanover, 6-502, 4-3, 4-128.

Lowestoft. Spt. and summer resort of Suffolk; pop. 43,170; important fisheries; captured by Cromwell (1643); Dutch fleet defeated by Duke of York (1665); former porcelain mfrs.; bombed 1940-43, 7-132.

Low German. Dialect, 4-2.

Lowlands. of Scotland, 6-510.

Lowther Hills. Scot. mt. range in Dumfriesshire and Lanarkshire, 4-444.

Loyalty Islands. Pacific group 60 m. E. of New Caledonia; area 800 sq. m. pop. 11,100; 6-26.

Loyola, Ignatius de, St. (1491 or 1495-1556). Founder of Jesuit Order, 5-46; and Francis Xavier, 7-506.

Lualaba. Upper course of r. Congo; discovered by Livingstone, 4-527.

Luanda. *See* Loanda.

Lubber's Knot. *See* Granny Knot.

Lubber's Line. In compass, 2-475.

Lubbock, Sir John. *See* Avesbury, 1st Baron.

Lubeck (loo'bèk). Ger. city and port in Land of Schleswig-Holstein, on r. Trave, 12 m. from Baltic; pop. 238,276; has blast furnaces, iron and steel works; shipyards. Once head of the Hansaatic League; 4-3.

Lubitsch, Ernst (1892-1947). Amer. film director, 2-401.

Lublin (loo'blin), Poland. City 95 m. S.E. of Warsaw; pop. (1939) 122,000; Rus. victory over Austrians in early part of 1st World War; in German occupation 1939-44; Russians re-take, 7-490.

Lu'can (Marcus Annaeus Lucanus) (A.D. 39-65). Rom. poet, author of the "Pharsalia," epic on civil war between Caesar and Pompey.

Lucarne, in architecture. a Fr. term for a garget window; also for the lights or small windows inset in spires.

Lucas van Leyden (Lucas Jacobz) (c. 1494-1533). Dutch painter and engraver, friend of Dürer.

Lucca (loo'ka). Old and picturesque city in n. Italy, 12 m. N.E. of Pisa; pop. 82,000; many antiquities; textiles.

Lucerne. Switz., cap. of canton of Lucerne; at N.W. end of Lake Lucerne; pop. 30,528; 5-48.

Lucerne. Type of grass used as cattle fodder; also known as alfalfa, 5-48.

Lucia di Lammermoor. Opera by Donizetti; story, 5-517.

Lucian (c. A.D. 120-180). Gk. writer and satirist who mocked at old faiths, philosophies and conventions. His writings give a valuable picture of the manners of his age; 4-34.

LUCIFER

Lucifer [lō'isfer]. Name of Venus as morning star; applied by Isaiah to king of Babylon ("How art thou fallen from heaven, O Lucifer, son of the morning!") and, through misunderstanding of this passage by later writers, to Satan.

Luciferin. Substance in light-producing cells of fireflies; 3-364.

Lucifers. The first phosphorus matches, 5-147.

Lucretius (180-103 B.C.). Rom. satirist, 4-450.

Lucknow. Tn. in Uttar Pradesh, Rep. of India; pop. 496,861, 5-49, 7-372; siege of 1857, 4-253.

Lucretia [lō'krē'shiā]. Rom. matron whose suicide (510 B.C.) because of outrage inflicted by Sextus, son of King Tarquin the Proud, provoked expulsion of the Tarquins.

Lucretius [lō'krē'shiūs]. (Titus Lucretius Carus) (c. 98-55 B.C.). Rom. poet-philosopher, 4-460.

Lucretius [lō'kul'us]. **Ludius** Lictinius (c. 110-57 B.C.). Immensely wealthy Rom. noble, conqueror of Mithridates; "Lucretian luxury" (esp. rich eating) has become proverbial.

Lucey, St. (St. Santa Lucia) (c. 283-304). noblewoman of Syracuse, Sicily; two attempts at torturing her having failed, she was finally killed by sword; festival December 13.

Lud. Legendary King of anc. Brit., after whom Ludgate Hill, etc., in London, are named.

Ludites. Bands of workmen organized in Eng. to smash machinery, 1812-18, in protest against displacement of hand labour, 4-132.

Ludendorff, Erich von (1865-1937). Ger. soldier; in 1st World War Hindenburg's chief of staff at Tannenberg; largely responsible for strategy of Ger. forces from 1916, 7-482; joined Nazis; and *Putsch* of 1923, 4-182, 4-10.

Ludgate. One of the main gates of London; gave name to Ludgate Hill and Ludgate Circus, 5-19.

Ludlow. 1. In in Shropshire, Eng.; market centre; ruins of Norman castle; "The Feathers," 7-14 illus.

Ludwig I [lōod'vīg] (1786-1868). King of Bavaria, munificent patron of art; abdicated in 1848; and Lola Montez, 1-388.

Ludwig II (1845-86). King of Bavaria, grandson of Ludwig I; patron of Richard Wagner; became insane and committed suicide, 1-389.

Ludwig, Emil (1881-1948). Ger.-Swiss playwright and biographer (*Bismarck*, *Lincoln*, *Beethoven*).

Ludwigshafen [lōod'vīgshāfen]. City in Land of Rhineland-Palatinate, on Rhine opposite Mannheim; chemical and other mfrs.; large trade in coal, timber, iron; pop. 106,550; heavily bombed by Allies in 2nd World War.

Ludwigslied. Old High German ballad (881), 4-12.

Lufwaffe. Ger. air force; in Battle of Britain, 2-76; losses, 2-79.

Lugano [lōgah'nō]. **Lake.** Deep, narrow lake enclosed by mts., partly in Switzerland, partly in N. It. between L. Maggiore and L. Como; 20 m. long, 4-301.

Lugard of Abinger, Frederick John *Deputy*, 1st Baron (1858-1945). Brit. administrator, soldier, and traveller; served with distinction in Afghanistan, the Sudan, and Burma; governor of Northern and Southern Nigeria (1912-13) and Nigeria (after union) (1914-19), 5-436; and in direct rule, 2-85.

Lugdunum. Rom. name for Lyons, France; theatres, 5-55 illus.

Lugg. R. of Eng. and Wales, 45 m. long; rises in Radnorshire and flows s. to join the Wye, 4-168.

Lugger. (Yacht carrying lug-sails (sail-banging obliquely to the mast and having two or three ribs). May have one, two or three masts and is occasionally fitted with topsails. Used by offshore fishermen.

Lugnaquilla. Mt., in Wicklow Mts., Ireland, 3,038 ft., 4-281.

Luguvallum. Rom. tn. See *Carlisle*.

Lugworm. A common marine worm; used as bait by sea-fishermen, 7-500.

Lulchart, Leech, Ross and Cromarty, Scot. 6-455.

Lulini [lōō'nē], **Bernardino** (c. 1470-c. 1535). Italian artist; most noted as a fresco painter; excelled at depicting sacred and mythological subjects.

Luke, St. Traditional author of the Third Gospel and of the Acts; he was companion to St. Paul on his missionary journeys. Festival, Oct. 18.

Luktehan. A depressed basin in N.W. China, nearly 400 ft. below sea level.

Lule [lōō'la] or **Lulea**, a r. in N. Sweden; 200 m. to Gulf of Bothnia.

Lulea [lōō'la], Sweden. Spt. on Gulf of Bothnia; pop. 16,500; ship-building; lumber, iron and ball-bearings; ice-bound in winter.

Lulli, Giovanni Battista. See *Lully, Jean B.*

Lullington Castle, Kent; silk mfrs., 7-53, 55 illus.

Lully, Jean Baptiste (1632-87). Celebrated composer, born Italy; taken to Fr. as a boy, worked as servant, rose to position of court musician to Louis XIV; introduced lively ballets; dominated Fr. opera for almost a century, 5-514; introduced horn into orchestra, 4-194.

Lully, Raymond (Ramón Lull, or Raymondus Lullius) (1235-1315). Catalan (Spain) alchemist and missionary; founder of western orientalism.

Lulworth Cove, Dorset, Eng. 3-108.

Lulworth Skipper Butterflies. 2-11 illus.

Lumbering. 6-49; power-driven saw, 2-200 illus. See also *Forestry*; *Trees*.

Lumen. Unit of luminous flow or passage (flux) of light. Defined as the amount of light emitted by a uniform point source of one candle in unit solid angle; if a source of luminous intensity of one candle is at the centre of a sphere of one foot radius one lumen of luminous flux will pass through each square foot of the surface of the sphere 621 lumens equal 1 watt. See *Candle-Power*; *Lux*.

Lumière [lūmyar], **Auguste** and **Marie Louise Nicolas** (1862-1954). French chemist and industrialist; brother of Louis Jean; joint inventor of the cinematographe (primitive moving picture machine), and system of colour photography, 2-392.

Lumière, Louis Jean; (1861-1948). French chemist and industrialist; in 1895 with his brother constructed the cinematographe, 2-392.

Luminous Fish. 1-450 illus.

Luminous Paint, fluorescence. 6-162.

Lump-suoker. A clumsily built fish (*Cyclopterus lumpus*), common in northern seas; heavy body marked with tubercles and ridges, and on chest a sticky disc enabling it to fasten itself to rocks; usually about 12 in. long; 3-371 illus.

Lu'na. In Rom. myth., the goddess of the moon and of months.

Lunacharsky, Anatoly Vasilievich (1875-1933). Russian politician; born of wealthy parents, became revolutionary in 1892; as people's commissar for education in Soviet government prevented destruction of books and works of art after Bolshevik revolution; promoted instruction of people and development of the theatre.

Lunacy, and the moon. 5-259.

Lunardi, Vincenzo (1750-1806). It. aeronaut; made first hydrogen balloon ascent in Eng. (1784), 1-354.

Lunar Eclipse. 5-237.

Lunar Month. 5-255.

Lunar Time, lunar day. 3-55.

Luncheon. Mid-day meal, 5-151.

Lundy. Isl. of Devon, off Barnstaple Bay, 3-247.

Lune. R. flowing through Westmorland, Yorkshire, and Lancashire to the Irish Sea; 45 m. long, 4-444.

Lüneburg, Ger. Tn. in Land of Lower Saxony. 22 m. S.E. of Hamburg; pop. 29,000; was prominent member of Hanseatic League; cement works, salt spring. At Lüneburg Heath, s. of tn., F.-M. Montgomery received Ger. surrender (May 4, 1945).

LUX

Lunette. In architecture, anything shaped like a half-moon, generally used in fortifications.

Lunéville [lūnāvēl]. Tn. of N.E. Fr. 18 m. S.E. of Nancy; pop. 20,300; important military centre; treaty between Fr. and Austria (1801).

Lunge. In fencing, 3-346.

Lung-fish, or Mud Fish. 5-51, 3-322 illus.

Lungs. Organs for breathing air, 5-51; in anatomy, 1-144; respiration and circulation of blood, 4-144, 6-389.

Lungwort. *Pulmonaria* of the order *Primulaceae* with hairy white-spotted leaves and blue cowslip-like flowers; grown in gardens, but very rare in wild state in Brit.

Lunt, Alfred (b. 1893). Amer. actor; famous on stage both in U.S.A. and Europe with his wife, Lynne Fontanne (*Reunion in Vienna*; *Idiot's Delight*).

Lupercalia. Rom. spring festival in honour of anc. god Lupercus.

Lupin. Garden flower of the bean family, with white, yellow, pink, or blue flowers on a central spike.

Lupulin. Bitter resinous substance in hops, 4-192.

Lureher. Hunting dog, cross between greyhound and sheepdog. Coat rough, grey-brown. Height 2-3 ft. Heavy build.

Lusaka. Seat of govt. in N. Rhodesia. Pop. 45,500; 6-394.

Lusladi. Epic poem by Luis de Camoens (1521-80), describing feats of Portuguese heroes, 6-268.

Lusignan, Guy de (d. 1194). Fr. king of Jerusalem and Cyprus, 3-21.

Lusitania [lūsitā'niā]. Anc. Rom. prov. comprising most of modern Port. and S.W. Sp., 6-268.

Lusitania. Brit. ocean liner, torpedoed and sunk by German submarine U20, May 7, 1915; 7-182.

Lut Desert. See *Great Salt Desert*.

Lute. Medieval stringed instrument, 5-309.

Lute-cium (Lu). Element of rare earth group; atomic no. 71; atomic weight, 171.99; 3-221, 6-352.

Luther, Martin (1483-1546). Leader of Prot. Reformation, 5-53, 6-376, 377 illus.; hymn-writing, 4-226; treatment of children, 3-338; influence in Ger. literature, 4-13; Ninety-Five Theses, 2-380; Henry VIII opposes, 4-164.

Lutheran Church, confirmation in 2-479; in Scandinavia and N. Ger., 6-377.

Lutine Bell. I.M.S. *La Lutine* was a French man-of-war. Captured, she became a frigate in the Royal Navy. On Oct. 9, 1799, she foundered with a cargo of gold and silver, off the Vlieland Is. on the Dutch coast. Her bell, which was later recovered, now hangs in Lloyd's, and is rung whenever a ship is posted as missing, and on other important occasions, 4-532 illus.

Luton. Tn. in Beds, Eng., 9 m. N.W. of Hitchin; pop. 110,370. Formerly important centre of straw-plait industry; engineering and motor works; hats, 1-404.

Luttworth. Tn. in Leics, Eng., 90 m. N.W. of London; John Wycliffe was rector here; pop. 3,000; 4-476.

Luttrell Psalter. Famous Eng. illuminated M.S., c. 1342, now in Brit. Museum, 6-117 illus. f.

Lutyens, Sir Edwin Landseer (1869-1944). Brit. architect, designer of public buildings and private houses. His works include the Cenotaph, Whitehall, London; Government buildings at Delhi; Hampstead Garden Suburb; Hampton Court bridge; Liverpool R.C. Cath., 4-528. New Delhi, 3-88; Queen Mary's doll's house, 3-105 illus. f.

Lützen [lüt'sen]. Ger. tn. in Saxony; battle of (1632), 7-270.

Lux. Unit of illumination. Defined as the illumination of the inner surface of a sphere of one metre radius due to a centre-point source of one candle. See *Candle-Power*; *Lumen*.

LUXEMBOURG PALACE

Luxembourg Palace, Paris, 6-83.
Luxemburg. Grand duchy of n.w. Europe; area 990 sq. m.; pop. 298,578, 5-54; invaded by Germany, 7-487; flag, 3-384 illus. f.
Luxemburg. Cap. of grand duchy of that name; pop. 61,998; 5-54.
Lux'or. Vil. in Upper Egypt on part of site of anc. Thebes, near Karnak; temple of Ammon, 3-187 illus., 3-197.
Luzern. See Lucerne.
Luzon. Northerly isl. of the Philippines; in 2nd World War, 7-491; rice-fields, 6-156, 157 illus.
Lwow (lvov). Former Polish town (Lwów), incorporated U.S.S.R. 1945 (formerly Lemberg); pop. 317,000.
Lyautey (lyōtā), Louis H. (1851-1931). Fr. soldier and administrator; served in Algeria, Tongking, Madagascar; resident commissary-gen. Morocco 1912-16, 1917-25; marshal in 1921; 5-265.
Lycæum. School at Athens founded by Aristotle, 1-228.
Lych-gate (Old Eng. *lic*, body). Roofed gate at entrance to churchyard, where at a funeral the coffin awaits the clergyman. Many old Eng. churchyards retain lych-gates, often complete with stone slab on which coffin rests.
Lycia. Anc. division of s.w. Asia Minor on Mediterranean; conquered by Persia, 6th cent. B.C., then subject in turn to Macedon, Egypt, Syria, and Rome.
Lycurgus (9th cent. B.C.). Law-giver to anc. Sparta; was called upon to rescue the state from mismanagement; afterwards left Sparta and was worshipped as a god. To him is attributed the Spartan military system of training; 7-121.
Lyd'ia. Anc. city of Palestine, 10 m. s.e. of Jaffa; modern vil. called Ludd; St. George said to have been born and buried here.
Lyd'ite. An explosive derived from picric acid.
Lyd'ia. Anc. kingdom in Asia Minor; early seat of Asiatic civilization with important influence on Greeks, later part of Rom. prov. of Asia; reign of Croesus, 2-533.
Lye (li). Watery solution of an alkali, particularly potassium hydroxide.
Lyell, Sir Charles (1797-1875). Brit. geologist; his studies and evidence established Hutton's "uniformitarian" theory of earth's evolution as foundation of modern geology;

proof of inorganic evolution led, in hands of Darwin and others, to idea of organic evolution.
Lyly (lil'i) or **Lilly, John** (c. 1554-1606). Eng. romancer and dramatist who introduced into Eng. literature the fantastic style of writing called "euphuism," 3-281.
Lyme Grass. A coarse grass which grows in poor soil in cold and temperate climates; called also wild rye.
Lyme Regis. Tn. of Dorset, on Lyme Bay; holiday resort; duke of Monmouth landed here in 1685; pop. 3,191; 3-107.
Lymington. Spt. and market tn. of Hants, Eng.; yachting centre. Steamer ferry service to Yarmouth, I.O.W.; pop. 22,210.
Lymph. Clear yellowish liquid surrounding all body cells, 1-490; calves' lymph used in inoculation, 7-373.
Lymphatic Glands. Small glands scattered throughout lymphatic system, but especially in the neck, armpits, groin, thighs, and body organs; produce corpuscular elements of lymph, incl. white corpuscles, 1-491.
Lymphatic System. A double network of vessels and glands containing lymph, and permeating nearly all structures of body; superficial network underlies skin, deep network permeates organs; conveys back to blood lymph which has exuded from blood-vessels into tissues; portion called lacteals conveys chyle from intestines; 1-490.
Lymphocytes. White corpuscles in blood, 1-490.
Lynch, Charles (1736-96). Amer. politician and soldier; said to have given name to "lynching."
Lynching. Summary punishment of suspected criminals by private individuals and without a regular trial; originated in U.S.A. during the War of Amer. Independence; victims usually Negroes accused of attacks on white women.
Lynn. Tn. in Mass., U.S.A., pop. 99,738; 5-115.
Lynton and Lynmouth. Two seaside villages in N. Devon; Lynton at top of a 400 ft. cliff, Lynmouth at foot. Holiday resort; flood damage, 3-391 illus.
Lynx. A large cat-like animal with short tail and tufted ears, 5-54; in Sweden and Norway, 3-312; fur, 3-196.
Lyon, Cornéille de (1505-74). Fr. portrait painter, 3-439.

MACASSAR

Lyonesse. Legendary lost land believed to have existed off Cornish coast. Many references in Cornish and Breton folk lore, 2-504.
Lyon King-of-Arms. Scot. king-of-arms, 4-165.
Lyons, Joseph Aloisius (1879-1939). Australian statesman; prime minister in 1932-39.
Lyons. Tn. of France, at junction of Rhône and Saône; pop. 160,748; 5-55, 3-433, 438; silk mfr., 3-137.
Lyra or Lyre. Constellation across North Pole from Ursa Minor.
Lyre (lirē). Harp-like instrument of Greeks; legendary invention by Hermes, 5-173.
Lyre-bird, 5-55, 6-78 illus. f.
Lyrical Ballads (1798). Volume of poems by Wordsworth and Coleridge, 3-288, 2-448.
Lyric Poetry, 3-284, 6-235.
Lys (lis) River. Rises in extreme N. of Fr. and flows n.e. 120 m. past Arras, then to the Scheldt in Belgium; 1-417.
Lysander (lisan'der) (d. 395 B.C.). Able unscrupulous Spartan admiral; defeated Athens at Argosopoli and terminated Peloponnesian War, becoming most powerful man in Greece; killed at outbreak Boeotian War before he could make himself supreme.
Lysenko, Trofim Denisovitch (b. 1898). Russ. biologist; and Laman'skian theory of evolution, 4-168.
Lys'ias (c. 459-378 B.C.), one of great Attic orators.
Lysimachus (c. 360-281 B.C.). King of Macedonia, 7-73.
Lyssippus (liss'pus) (4th cent. B.C.), Gk. sculptor, 4-90.
Lysol, disinfectant, 1-177.
Lyte, Henry Francis (1795-1847). Brit. divine; wrote "Abide with Me" 4-226.
Lytham (lith'am) St. Annes. Seaside resort in Lancs, Eng.; pop. 30,298; 4-444.
Lytton, Edward George Earle, Lytton Bulwer Lytton, 1st Baron (1803-73). Brit. novelist, playwright, and politician, 5-56.
Lytton, Edward Robert Bulwer-Lytton, 1st Earl of (1831-91). Brit. statesman and poet, son of the preceding; Viceroy of India (1876-80); wrote verse under pen-name of Owen Meredith, 5-56.
Lytton, Sir Henry (1867-1936). Brit. actor (leading comic roles in Gilbert and Sullivan operas); knighted in 1930.

M

SIX thousand years ago our letter M was an owl, and to this day the owl's "horns" remain in those two peaks—and the beak between them, where it is in the real owl. It must have taken considerable time to draw the owl as it appeared in Egyptian picture-writing, so a very much simplified form was developed by the Egyptian scribes who wrote on papyrus. The early Phoenicians, carving on stone, naturally gave the

letter a more angular character. It is easy to see how this developed into the symmetrical Greek *μ* and Roman M which we use. In sound *m* is called a labial nasal. It is made by sending the breath through the nose while the lips are closed and the vocal cords are vibrating. Its pronunciation has changed but little since ancient times. Like *l*, *n*, and *r*, it may stand alone as a syllable without the aid of any vowel, as in *chaasm*.

Maas. Name given to r. Mouse in the Netherlands, 5-185.
Maastrie't. See Maastricht.
Mab. "Queen Mab" in Celtic and Eng. folk lore, a fairy presiding over dreams; mentioned in Shakespeare's *Romeo and Juliet*, 1, iv; originally a legendary queen Maev of Connaught.
Mabinogion (mabin'gion). A collection of anc. Welsh bardic tales, particularly the collection of 12th-cent. knightly romances translated by Lady Charlotte Guest, 7-415.
Mabuse (mab'us), Jan. Name adopted by the Flemish painter Janni Gos-

sart (d. 1532), first of the "Italianised" Flemings, 5-381.
McAdam, John Loudon (1756-1836). Scot. engineer and inventor, 5-57; McAdam road foundation, 6-407.
MacAlpine, Kenneth, King of the Scots. See Kenneth I, MacAlpine.
Macao. Portuguese territory in China at mouth of Canton r.; area 6 sq. m.; 6-268.
Macaque or Bonnet Monkey, 5-241.
Macaroni. It. wheat paste, made into long tubes, 5-57.
Macaroni. Name for a particular type of Eng. 18th-cent. dandy, A

group of young men, aping continental tastes and fashions, formed the Macaroni Club. They wore fantastic wigs and clothes, and carried tall tasseled canes.
MacArthur, General Douglas (b. 1880). Amer. soldier, 5-57; in Korea, 4-426; in Philippines, 6-167.
Macassar (makas'ar). Spt. and cap. of Celebes, Indonesia, on w. coast of s. peninsula of isl.; pop. 85,000; source of Macassar oil; 2-286.
Macassar, Strait of. A channel separating isl. of Borneo and Celebes, and marking a celebrated biological division. See Wallace's Line.

MACAULAY

Macaulay, Thomas Babington Macaulay, Baron (1800-59). Brit. essayist, poet, historian. 5-58, 3-290; "How Horatius Kept the Bridge," 5-59; lines on the Golden Bough, 3-461; character of Charles II, 2-308; his memory, 5-168.

Macaw. Bird of the parrot family. 5-81, 5-80 illus. f.

Maeyo. See **Maesio**.

Maebeth. Shakespeare's tragedy. 5-81.

Maecabees. The five sons of Mattathias, a Jewish priest who led the Israelite armies against Syria. 4-375.

MacCarthy, Sir Desmond (1877-1955). Brit. author and literary critic; and Post-Impressionist. 6-270.

MacCarthy, Justin (1830-1812). Brit. (Irish) historian, journalist, and Nationalist leader, in succession to Parnell (*History of Our Own Times; Modern England, Reign of Queen Anne*).

MacCarthy, Justin Huntly (1860-1936). Brit. historian, dramatist, novelist, (*If I Were King*), and politician; his prose version of Omar Khayyam. 5-511.

Maechu Pichu. Ruined Inca town in Peru. 6-140 illus.

Maesfield. Tn. in W. Shropshire, 12 m. s.w. of Stockport; noted for silk mfrs.; has also textile and brewing industries; pop. 35,980.

McClintock, Sir Francis Leopold (1819-1907). Brit. sailor and Arctic explorer who made 4 expeditions in search of Sir John Franklin's expedition; McClintock Channel is named after him.

McClure, Sir Robert John LeMesurier (1807-73). Brit. sailor and Arctic explorer, born in Ireland; discoverer of North-West Passage. 6-242, 1-135 map.

McCormack, John (1885-1945). Irish tenor, made first London appearance at Covent Garden, and later became a citizen of the United States; he was made a Count by the Pope in 1928.

MacCrae, John (1872-1918). Canadian poet. 2-203.

Macdonald, Flora (1722-1790). Scot. Jacobite heroine. 5-61; and Prince Charles Edward. 4-335.

Macdonald, George (1824-1905). Scot. poet, preacher, novelist, who depicted Scottish life and manners in a most faithful and realistic manner (*David Elphinstone; Robert Falconer*, etc.), and writer for children (*At the Back of the North Wind*; and other fairy tales).

Macdonald, Jacques Etienne Joseph Alexandre (1763-1840). Marshal of France and Duke of Tarento; broke Austrian centre and won victory of Wagram; created marshal by Napoleon on that battlefield.

MacDonald, James Ramsay (1866-1937). Brit. statesman; first Labour prime minister of Gt. Brit. 5-81; and Attlee. 1-306, 4-427.

Macdonald, Sir John Alexander (1815-91). Canadian statesman; first Premier of the Dominion. 5-82.

MacDonald, Margaret (d. 1911). Wife of Ramsay MacDonald; social work. 5-62.

McDougall, William (1871-1938). Brit. psychologist. Founder and leading exponent of "Normic" school of psychology, but worked principally in U.S.A. Works include: *Body and Mind, Outline of Psychology; Psycho-Analysis and Social Psychology*.

MacDowell, Edward Alexander (1861-1908). Amer. musician; called greatest and most original of Amer. composers and "Wordsworth of music" ("To a Wild Rose").

Maese. A spice obtained from nutmeg. 5-486.

Maesonia. A region of s.e. Europe, once seat of empire under Alexander the Great. 5-83, 1-99; conquest of Sparta. 7-124; 7-517; map. 7-518.

Maesio (mahai) or Maeyo, Brazil. Port on Atlantic coast, 135 m. s.w. of Pernambuco; pop. 129,000.

Mazewin, Sir William (1848-1924). Brit. surgeon. Made important ad-

vances in bone surgery and brain surgery. Pioneer in opening up the chest for surgical operation. Invented his own instruments. 5-155, 7-195.

McGill College and University. A leading Canadian institution, at Montreal, opened in 1821. 2-197 illus., 203.

MacGillivuddy's (magil'ikudi) Reeks, Irish Rep. Group of mts. in co. Kerry, to w. of Killarney; three of summits over 3,000 ft. high; between the Reeks and Mangerton are the Lakes of Killarney; 4-281.

McGrady's Yellow. Variety of rose. 6-453 illus. f.

MacGregor, John (1825-1892). Scot. traveller. After various early travels, he started in 1865 in his canoe, the original Rob Roy, and explored the rivers and lakes of W. and Central Europe. Later trips included one through the Red Sea and up the Jordan. Became himself known as Rob Roy also.

MacGregor, Robert. See **Rob Roy**.

Maeh (mahkh), Ernst (1838-1916). Austrian physicist and psychologist; strongly influenced modern scientific and philosophical thought. 6-160.

Maehavelli (mak'evell'), Niccolò (1469-1527). Italian diplomat and writer. 5-63, 4-313; *The Prince*, 2-17, 4-330.

Maehico. Tn. in Madeira, pop. about 8,000; 5-86.

Maehicola's Den. In architecture, an aperture between the corbels that support a projecting parapet; formerly much used in castellated architecture, and intended to allow the hurling of missiles on assailants.

Machine-gun. 5-68, 1-174.

Mach Number. In aeronautics, the ratio between the speed of an aircraft and the speed of sound (Mach 1) under similar atmospheric conditions; named after Ernst Mach.

Maehelab. Cave of. Hobion, Palestine; tomb of Abraham. 6-48 illus.

Maehintosh, Charles (1768-1843). Scot. chemist, took out a patent for water proof fabrics. 6-464.

Maekall, John William (1859-1945). Brit. scholar and critic, professor of poetry Oxford Univ. (1906-11), translations of Gk. and Latin literature, with criticisms; married daughter of Burne-Jones; received O.M. in 1935.

Maekay. Port in Queensland Australia, on r. Pioneer; exports sugar, timber, copper, gold, pop. 12,600, 6-324.

McKay, Gordon (1821-1903). Amer. inventor; his boot and shoe machinery revolutionized industry.

McKen'na, Reginald (1863-1913). Brit. statesman and financier, Liberal member House of Commons (1895-1918); first lord of Admiralty 1908-11; home secretary 1911-15; chancellor of the exchequer 1915-16.

Maekensen, August von (1849-1945). Ger. soldier, associate of Ludendorff and Hindenburg in 1st World War; commanded decisive offensives against Serbia, Rumania, and Russia.

Maekenzie, Sir Alexander (1755-1820). Brit. explorer; employee North-West Fur Co.; discovered Mackenzie r., and was first white man to reach Pacific overland; 2-199, 5-64.

Maekenzie, Alexander (1822-92). Canadian Liberal statesman, b. Scot.; premier 1873-78; administration introduced vote by ballot, created supreme court of Canada and organized territorial govt. of North-West Territories.

Maekenzie, Sir Compton (b. 1883). Brit. novelist and playwright, son of Edward Compton, famous actor (*Sinister Street; Sylvia Scarlett; Poor Relations; Carnival*). 6-514.

Maekenzie, District of, Canada. Named after Alexander Maekenzie; it was merged in the North-West Territories in 1911.

Maekenzie. Greatest r. of Canada. 5-64, 2-196, 5-642.

Maekereel. Marine food fish. 5-84. See also **Fish** (list).

MACRAME

Maekereel Family, the Scrombridae, a large and important family of spiny-finned fish with spindle-shaped bodies.

McKinley, William (1843-1901). 25th president of U.S.A., 1897-1901. Assassinated at the Pan-American Exposition, Buffalo.

McKinley, Mt. Highest peak in Alaska Mts., N. Amer., 20,464 ft., 1-89, map, 1-89, 5-452, 453 illus.

Macintosh, Charles Bonnet (1869-1928). Brit. architect; exponent of "functionalist" architecture, a notable example of his work being the Glasgow Art School; 1-218.

MacLaren, Archibald Campbell (1871-1944). Brit. cricketer. Played for Lancashire 1890-1926, for England in Australia (three tours), and against Australia in Eng. (five tours). His 424 (v. Somerset in 1895), is highest individual score ever made in England.

Maclaren, Ian. Pen-name of R. John Watson (1850-1907), Scottish author, whose stories of Scottish life were once widely read (*Bend the Bonnie Brier Bush*).

Maclaren, Kaid Sir Harry (1848-1920). Brit. soldier; entered service of Sultan of Morocco, captured by brigand Raisuli and ransomed for £20,000.

Maclish, Archibald (b. 1892). Amer. poet; "Conquistador"; radio verse dramas, *The Fall of the City, Air Road*; 7-306.

Maclod, Professor John James Richard (1876-1935). Worked with Banting on insulin. 4-270

Maclise (mak'ise), Daniel (1806-70). Brit. painter of portraits and historical compositions, "Death of Nelson" and "Meeting of Wellington and Blucher" in House of Lords. R.A. in 1840. 3-261

MaclMahon, Marie Edmé Patrice Maurice de (1808-93). Duke of Magenta and marshal of Fr. crushingly defeated at Sedan (1870), as 2nd pres. of republic (1871-79) pursued reactionary policy.

Maomilian, Harold (b. 1894). Brit. politician; min. resident at Allied h.q. v.w. Africa 1942-15; Dec. 1944 tried to end Greek rebellion, became min. of housing and local govt. in 1951; min. of defence, 1954-5; foreign sec. 1955, chancellor of exchequer 1955.

Maomilian, Hugh Pattison Maomilian, Baron (b. 1873). Brit. lawyer, chairman of royal commissions on lunacy, coal-mining finance, in industry, etc.; first min. of information in 2nd World War.

Maomilian, Kirkpatrick (1810-78). Brit. blacksmith, inventor of bicycle 3-15.

McMillan, Margaret (d. 1931). Brit. educationist; successfully fought for medical inspection in schools; founded Deptford health school clinic and Rachel McMillan Coll. for infants' teachers.

Maomurrough, Dermot. See **Dermot**.

McNaughton, Gen. Andrew G. L. (b. 1887). Can. soldier, in 1st World War; reorganized army on return; led 1st. Can. div. to Gt. Brit. in Dec. 1939; commanded 1st. Can. corps 1942, but resigned 1943 through ill health, in 1944 min. of nat. defence, and an representative on U.N. Atomic Energy Commission.

Maenice, Louis (b. 1907). Brit. poet from 1941 a writer of feature programmes for the B.B.C., *Christopher Columbus, The Dark Tower* with W. H. Auden, *Letters from Iceland*.

Maella, Cyril. See "Sapper."

Maen. U.S. airship. 1-33.

Maeharson, James (1736-98). Brit. author, professed "translator" (now generally believed author) of the poems of Ossian.

Maerame (makrah'ma) Lace. A delicate lace trimming of knotted thread.

Genoese macramé, used for trimming wedding trousseaux; popular

MACREADY

in Gt. Brit. as industry towards end of 19th cent.
Macready (mak'red'i), William Charles (1793-1873). Celebrated Brit. tragic actor, first appeared at Birmingham in 1810, playing Romeo; acted with Mrs. Siddons, and made first appearance in London at Covent Garden in 1816; achieved great success as Richard III, Hamlet, and Coriolanus; was leading actor at Drury Lane theatre from 1823 to 1830.
Macrocystis, a brown seaweed, 1-104.
Macropodidae. The kangaroo family, 4-392.
Macula, of eye, 3-334.
Madagascar. Fr. isl. in Indian Ocean, off E. Africa; area 241,094 sq. m.; pop. 4,350,700 (including Mayotte and Comoro Islands), 5-64.
Madame Butterfly. Opera by Puccini; story, 5-518.
Madame Butterfly, rose, 6-452 illus. f.
Madariaga, Salvador de (b. 1886). Sp. diplomat and scholar; prof. of Sp. studies, Oxford, 1928-31; ambass. to U.S.A. in 1931, to France 1932-34; wrote *Shelley and Calderón*, etc.; on *Hamlet*, 4-123.
Madden Lake. Panama Canal; area 22 sq. m.; reservoir for Gatun Lake, 6-59.
Madder. Dye obtained from various plant species inc. *Rubia tinctorum*; red to purple tints, with mordants (aluminas), the colouring principle, is yellow, 3-141.
Maddox, R. L. Inventor of dry-plate photographic process, 6-170.
Madeira. Isl. group off coast of Africa; 314 sq. m.; pop. 269,179; 5-65, 6-267.
Madeira River. Largest trib. of Amazon; flows N.E. 500 in. from frontier of Bolivia through W. Brazil.
Madeira Wine, 5-66.
Madeleine, The. Church in Paris, 6-84.
Madhya Bharat. State of Rep. of India; area 46,710 sq. m.; pop. 7,941,642; cap. Gwalior, 4-241.
Madhya Union (Pradesh). State of Rep. of India; cap. Nagpur; area 130,323 sq. m.; pop. 21,327,898; 4-241.
Madison, James (1751-1836), 4th pres. of U.S.A.; elected Democ. pres. in 1808 and 1812.
Madison, Wisconsin, U.S.A. State cap. and summer resort in S. centre; 75 m. W. of Milwaukee; pop. 95,594; univ.; mfrs. boots and shoes; trades in tobacco; 7-464.
Madison River, one of headstreams of the Missouri, 230 m. long.; rises in Rocky Mts.
Madonna. The Virgin Mary in religion and art, 5-86.
Madonna Lily, 4-506, 507 illus.
Madonna of the Chair. Painting by Raphael, 5-68 illus.
Madonna with St. Anne. The. Cartoon by Leonardo da Vinci, 4-483 illus.
Madras. South-eastern state of the Rep. of India; area 60,800 sq. m.; pop. 35,670,000; cap. Madras city; 5-66, 4-241. In Oct. 1953 a new state, Andhra (q.v.), was created out of the northern part of Madras state, with area 67,000 sq. m., and pop. 21,282,000.
Madras. City and cap. of Madras state, India; pop. 1,416,000, 5-69, 4-252, 4-241.
Madrid. Cap. of Spain; pop. 1,618,435; 5-70, 71 illus.
Madrid, University of. Largest in Sp. and one of the leading institutions of Europe; founded in 1508, but did not become real univ. until 1836, when univ. of Alcalá was moved to Madrid and combined with it; most of the students are under the medical and law faculties.
Madrigals. Part songs; in Tudor Eng., 5-304, 7-57.
Madroña Laurel. Species of arbutus, 1-201.
Madura. Isl. in Indonesia N. of E. Java; 2,189 sq. m.; pop. 1,744,000; numerous hot springs and a mud volcano; isl. is a plateau-like prolongation of the N. Java limestone range; 4-257.

Madura. Tn. in Madras state, India; pop. 339,000; Sundareswara temple, 5-70 with illus.
Maender. See Meander.
Maecenas (mēs's'nas or mīk'ā'nas), Gaius (70 B.C.-8 A.C.). Trusted counsellor of Emperor Augustus and patron of Virgil, Horace, and other writers. A modern patron of the arts is often called a Maecenas; Horace and, 4-193.
Maelstrom (mäl's'trom) or Malström. Celebrated whirlpool or current N. of Norway, near S.W. end of Lofoten Isls.
Maes, Nicholas (1632-93). Dutch painter renowned for rendering of minute detail, 5-384.
Maestricht (mah's'trikht) or Maastricht. City on Meuse in Netherlands; pop. 79,490; sandstone quarries; makes beer, brandy, cigars, glass, earthenware.
Maestrlnek, Count Maurice (1862-1949). Belgian dramatist, 5-72, 1-405.
Mafeking (ma'fok'ing). Tn. in Cape of Good Hope prov., S. Africa; trading centre for W. Transvaal and Bechuanaland; Brit. under Baden-Powell besieged Oct. 12, 1899, to May 17, 1900, 1-345, 1-502; relief was celebrated as a great national triumph, and introduced into the language the verb "to maffick," meaning to indulge in wild, boisterous forms of celebration.
Maia (mah'fio). A Sicilian secret organization broken up by Mussolini.
Magalhães, Fernão de. See Magellan.
Magallanes, formerly Punta Arenas. Port and coaling station of Chile, on N.W. shore of Strait of Magellan; pop. 33,100; mining; stockraising district; exports wool.
Magazine, in rifles, 3-360.
Magdala (magdahl'a). Fortified tn. in Abyssinia; it was carried by storm by the Brit. under Sir Robert Napier (1868), 1-7.
Magdalen (mawd'lin) (St. Mary Magdalen) College, Oxford, 5-17, 19 illus.
Magdalene (magdahl'na). R. of Colombia, S. Amer.; rises in Andes in S.W., flows N. 1,000 m. to Caribbean at Barranquilla; 2-457.
Magdalene (mawd'lin) College, Cambridge, 2-182; Pepys's diary and library, 6-131.
Magdeburg (magdeboorg). Ger. city on E. Elbe, 75 m. S.W. of Berlin in Soviet zone; pop. (1939) 334,306; sugar, textile, machinery mfrs.; 4-4.
Magellan, Ferdinand (1480-1521). Port. navigator, 6-77; voyage round the world, 1-133; explorations in Pacific 6-29; discovered Philippines, 6-157, his ship *Victoria*, 1-136 illus.
Magellan, Strait of. Passage between mainland of S. Amer. and Tierra del Fuego, discovered by Magellan, 1-133, 7-96.
Magenta (majen'tai). Tn. in N. It., 15 m. W. of Milan; battle in 1869 in which French and Italians won great victory, over the Austrians; 4-316.
Magenta. An aniline dye of brilliant red-purple colour, discovered shortly after the battle of Magenta and named after the town.
Magersfontein (mager'sfont'ain). S. Africa. Scene, at R. Modder, Orange Free State, of defeat of Brit. force under Lord Methuen by the Boers in Dec. 1899.
Maggiore (mahj'aw'r'a) Lake. In Switzerland and N. It., 83 sq. m.; famous for scenery; 4-304.
Maggots. The larvae of flies, 4-448.
Magi (mā'ji). Priestly and learned caste of anc. Medes and Persians. Term often used for "wise men of the East," who came to greet the newly-born infant Jesus, 4-363.
Magie, 5-77; and acting, 3-114; and bells, 1-424; weather hats, 5-80 illus. f. See also Superstitions.
Magie Circle. Club of professional and amateur conjurers, founded in London in 1905, 2-480.

MAGOG

Magie Flute, The. Opera by Mozart; scene from, 5-514; story of, 5-518.
Magie Lantern, in development of cinema, 2-389.
Maginot (ma'zhend) Line. Line of fortifications along part of the eastern frontier of France; the conception of M. Maginot, Fr. war minister, who died in 1932; outflanked in 2nd World War, 7-488.
Magistrate. Person vested with authority to administer the law. In Eng. there are two kinds, paid and unpaid; the latter requires no qualifications and is called a Justice of the Peace. Paid magistrates are usually barristers appointed by the home secretary. In Scot. magistrates are called *justices*.
Magna Carta. Charter of Eng. liberties, 5-80; power of the barons, 5-86, King John and, 4-378; sealed by John, 3-277 illus. f.
Magna Graecia. In anc. geography, name given to Gk. settlements in S. It. and Sicily.
Magnesia (MgO) or magnesium oxide. A white powdery substance obtained by burning magnesium in air.
Magnaesia, Battle of (190 A.C.). Decisive victory of Romans over Antiochus the Great at anc. tn. of Magnesia, Asia Minor, 20 m. N.W. of Smyrna.
Magnesian. A magnesium ore, 5-81.
Magnesium (Mg). A silver-white metallic element of the alkaline earth group; light and hard; atomic no. 12; atomic weight 24.32; 5-81, 3-221; and acids, 1-12; 5-177; hydroxide, 1-112.
Magnet. A mass of iron or other material which possesses the property of attracting or repelling other masses of iron, and which also exerts a force on a current-carrying conductor placed in its vicinity, 5-81; cobalt in, 2-434; of cyclotron, 3-17 illus.; in motors, 5-275; special alloys, 1-116.
Magnetic Brakes, 2-44.
Magnetic Compass, 5-83.
Magnetic Cranes, 2-525.
Magnetic Equator. See Acoline Line.
Magnetic Field. Space in the neighbourhood of an electric current, or of a permanent magnet, throughout which the forces due to the current or magnet can be detected, 5-82 diag.; 5-83 diag.; 5-85 diag.; in electric motors, 5-275; in ship and magnetic mines, 5-220 diag.
Magnetic Mine, in naval warfare, 5-220 with diag.
Magnetic Pole. One of the two points on a magnet where its magnetic powers are strongest, 5-82.
Magnetic Poles, of earth. Point near the N. and S. geographic poles towards which lines of earth's magnetism converge; north magnetic pole, 5-460, 5-83; south magnetic pole, 7-103.
Magnetism. Property of iron, steel, nickel, and a few other metals of exerting attraction or repulsion upon other magnets, due to electron movements within the metals, 5-81; and compass, 2-474; and electricity, 3-214, 215 diag.; and finding minerals, 5-215; and working of dynamos, 3-142; of earth and aurora borealis, 1-310.
Magnetite or Lodestone. Iron ore with magnetic properties, 4-288; crystals, 5-213 illus.
Magne'to. Small dynamo with permanent magnets; produces periodic high-voltage impulses; in internal combustion engine, 5-279.
Magnetometer. An instr. consisting of a pivoted magnetic needle for measuring the strength of magnetic fields.
Magnifying Glass. Convex enlarging lens, 4-481, 5-522 illus.
Magnol, Pierre (1838-1716). Fr. botanist and doctor; magnolia named after, 5-86.
Magnolia. A flowering tree, 5-98.
Magnoliaceae. The magnolia family of plants, with triple petals and sepals; includes magnolias, 5-86.
Magog. See Gog and Magog.

MAGOT

Magot (monkey). See *Barbary Ape*.
Magpie. Bird of the crow family, 5-86; egg, 1-432 illus. f.; fledglings, 1-487 illus.
Maggie Muth, 4-269 illus., 2-144 illus.
Maggie Mushroom, 3-488 illus. f.
Maguay. See *Agave*.
Magyars. A Finno-Ugric race appearing in Europe in 9th cent., 5 86, 3-314; language, 4-206.
Mahabharata (mahab'h'arata). Hindu epic of the Delhi kings, 4-251.
Mahasarakham. Tn. in Niam, used as summer capital; 7-15.
Mahawell. R. of Ceylon, 207 m. long, 2-297.
Mahdi (mah'di). The Mahomedan Messiah; various pretenders have claimed the title; the Sunnites hold that the true Mahdi has not yet appeared; name given to Mahommed Ahmed (1848-85), 3-178, 4-48.
Mahé. Former Fr. settlement on Malabar coast, India; 26 sq. m.; pop. 14,100; 4-240. Transferred to India, 1954.
Maher Pasha, Ali (b. 1883). Egyptian politician and lawyer, 3-182.
Mahler, Gustav (1860-1911). Austrian composer; nine symphonies; *Song of the Earth*; *Kindertotenlieder*.
Mahmud I (mahm'ud) (1696-1754). Sultan of Turkey, most of whose reign was spent in warfare with Austria and Russia; he gained successes over the former, recovering Belgrade, but lost the Crimea to the Russians.
Mahmud II (1785-1839). Sultan of Turkey, succeeded in 1808; suppressed janissaries; forced to recognize independence of Greece.
Mahmud of Ghazni (971-1030). Afghan conqueror, sultan of Ghazni 997-1030; numerous invasions of India, commencing in his youth under the leadership of his father Subuktigin; established rule over India.
Mahogany, 5-87; in furniture, 3-494.
Mahomet, 700-632 and Mahomedanism. 1 under of Mahomedanism, 5-87; the teaching of the Koran, 4-421; Mahomedans in Albania, 1-91; spread of Arab influence, 1-192; in Balkans, 1-350; calendar, 2-174; in Nigeria, 5-136; conquest of Persian empire, 6-131; pilgrimage to Mecca, 5 156, 155 illus. See also *Arabs*; *Crusades*; *Moors*.
Mahommed Ahmed. See *Mahdi*.
Mahommed Zahir (b. 1914). King of Afghanistan, 1-47.
Mahón. Seaport of Minorca, Balearic Isles; and mayonnaise, 1-349.
Mahout (mah'out). Elephant driver, 3-227, 226 illus.
Mahrattas (mah'rat'az). Hindu tribes of cent. and W. India; conquered and ruled many states, forming a powerful confederacy 17th and 18th cents.; power destroyed by Wellington, 7-436.
Mala (mal'a). In Gk. myth., mother of Hercules.
Maldá. Battle of. Engagement of Napoleonic War, July 6, 1806, between British and French near Italian town of that name. British victory commemorated in name of London dist. Maldá Vale.
Malden, The. Open green space in Calcutta, 2-173.
Malden Castle. Earthworks near Dorchester; excavations at, 3-108.
Maldenhair Fern. A fern, rarely found wild in Brit., with dark brown polished stem and much-divided fronds.
Maldenhead. Tn. in Berks, Eng., on the Thames; favourite boating resort; pop. 27,125.
Mald Marian. Character in Robin Hood legends, 4-416.
Maid of Orleans. See *Joan of Arc*.
Maldstones. Co. in Kent, Eng.; pop. 54,026; on r. Medway, 4-398.
Mall Coach, in 18th cent., 6-411 illus.
Mallot (malyot) Aristide (1861-1944). Fr. sculptor; "La Méditerranée," 6-520 illus.
Maimonides (mimon'idéz) or *Moses ben Maimon* (1135-1204). Jewish

rabbi and philosopher; one of the principal Jewish teachers, he wrote mainly in Arabic (*The Guide to the Perplexed*).
Main (mfn). R. in S. Ger. formed by Red and White Main; has tortuous course w. for 310 m., joining Rhine opposite Mainz; 6-390.
Maine. Old prov. in N.W. Fr. s. of Normandy; chief city, Le Mans.
Maine. Northernmost of New England states, U.S.A.; area 33,215 sq. m.; pop. 913,774; cap. Augusta; 5-90.
Mainland. Largest of the Shetland Isls.
Mainland or Pomona. Largest of the Orkney Isles.
Maintenon, Madame de (1635-1719). Wife of Louis XIV of Fr., 5-42 illus.
Mainz (mints). Commercial city in N.W. Ger., cap. of the *Land of Rhineland Palatinate*. Products incl. motor vehicles, machinery, metal goods, chemicals, wines and paper. Pop. 75,000.
Maipo (mipo) or *Maipo*. R. of Chile; rises in Andes, flows 120 m. w. to Pacific, just s. of Santiago.
Maitland, Frederick William (1850-1906). Brit. jurist and historian (*History of English Law*; *Canon Law in England*); notable alike for sweetness of character, acuteness in criticism and wisdom in counsel.
Maize, or Indian corn, 5-90; in Peru, 6-142; rust fungus, 6 181 illus.; and Hlathwa legend, 5-35.
Majestic. Variety of potato, 6-273.
Majlis. Persian parliament; Mossadeq and, 6-132.
Majolica Ware, variety of pottery, 6-277, 276 illus. f.
Major. In Brit. army, lowest rank of field officer; next above captain, below lieutenant-colonel. Insignia of rank is a crown.
Major (music). See *Musical Terms* (list).
Majorca (majaw'ka) (Span. Mallorca). Largest of Balearic Isls. (Spanish); 1,330 sq. m.; pop. 272,450; cap. Palma; 1-349.
Majuba Hill, in N.W. Natal, S. Africa, where Boers defeated British in 1881, 1-502.
Makalu. Mt. of Himalayas on the border between Nepal and Tibet, 27,790 ft., 4-176.
Make and Break Contact, in induction coil, 4-258, with diag.
Makerere College, Kampala, Uganda, E. Africa; founded 1925 as Technical Coll.; in 1939 re-constituted as Higher Coll. for E. and cent African territories; 7-343.
Make-up. The use of cosmetics, 5-91; in anc. Egypt, 1-175.
Malabar (mal'abar) Coast. Name often given to W. coast of India as far N. as Bombay; properly confined to S. part; Western Ghats, 4-240.
Malacca. Brit. settlement in Malaya; area 610 sq. m.; pop. 239,356; 5-94; tree money, 5-234 illus.
Malachi (mal'aki). 39th book of Old Testament and last of minor prophets, written between 484 and 424 B.C.
Malachite (mal'akite). A bright green basic copper carbonate ore, commonly found massive though occasionally in stalactitic and other forms; found in Ural Mts., in France and elsewhere; prized as ornamental stone.
Malade Imaginaire, Le. Comedy by Molière, 5-232.
Maladetta. See *Pic de Néthou*.
Malaga (mal'aga), Spain. Mfg. city and spt. on Mediterranean, pop. 276,222; taken from Moors by Christians in 1487; exports wine, grapes, raisins.
Malagasy. Natives of Madagascar, 5-65.
Malan, Adolph G. ("Sailor") (b. 1910). S. African airman; won D.F.C. at Dunkirk, D.S.O. in Battle of Britain, and later bars to both; led Torch Commando in 1951, pledged to defeat S. African Nationalist govt.
Malan, Daniel F. (b. 1874). S. African statesman; min. of interior in Nationalist govt. 1924; resigned 1933 to lead Nationalist Repub. party; Jan. 12, 1942, moved that Union should retire from war and leave the

MALPIGHI

Commonwealth; prime minister, 1948-54, being succeeded by Johannes Gerhardus Strydom; 7-92.
Mälär, Lake. Sweden, extends inland from Baltic Sea at Stockholm; 450 sq. m.; of irregular shape, contains some 1,200 isls.
Malaria. Disease carried by the *Anopheles* mosquito, 5-91; in Panama, 6-54; quinine, 6-325.
Malaspina (malaspe'na) Glacier. Largest glacier in Alaska, w. of Yakutat Bay; covers 1,500 sq. m., 1-89.
Malaya. s.w. extremity of mainland of Asia; comprising Federation of Malaya and Singapore Colony (former Malay States and Straits Settlements); area of Federation of Malaya 51,000 sq. m.; pop. 5,800,000; 5-93, 5-96 illus.; rubber plantation, 6-464 illus.; in 2nd World War, 7-119; University, 7-56.
Malayan Bear. See *Honey Bear*.
Malcolm (mal'kom). Name of four kings of Scot.; the most noteworthy was Malcolm III (Canmore), who ruled from 1051-93; he several times invaded Eng., and was killed at Malcolm Cross, in Northumberland.
Maldivé Islands. Group of 13 coral islets in the Indian Ocean, s.w. of India; a sultanate under Brit. protection. In 1953 became a republic after 836 years as sultanate, but reverted to sultanate in 1951.
Maldon (mawl'don). Small port of Essex, on r. Blackwater, 40 m. N.E. of London; Danish victory over English in 991; 3-298.
Malebranche (malbranhsh), Nicolas (1638-1715). Fr. philosopher, follower of Descartes; 6-160.
Malenkov, Georgi Maximilianovich (b. 1901). Prime minister of the U.S.S.R. 1953-55. Born at Orenburg (now Chkalov). Trained as engineer; joined Communist party 1920; in 1939 became sec. of the party's central committee. Member of Politburo 1916. Became premier on death of Stalin; resigned two years later and was made minister for electric power stations.
Malherbe, D. F. (b. 1879). S. African writer, 7-91.
Malia, Cape. The s.e. extremity of Morca, the s. peninsula of Greece.
Malic Acid. An organic acid found in apple juice.
Malines (mah'len) or *Meehlin*, Belgium. Mfg. city 14 m. s. of Antwerp; pop. 61,000; ecclesiastical cap.; noble Gothic cath.; once famous for lace; 1-417.
Mall, The, London; processional way leading to Buckingham Palace, 5-21.
Mallaig. Small port, Inverness-shire Scot., 4-273.
Mallard. Wild duck of Gt. Brit. and N. hemisphere, 3-132; egg, 1-152 illus. f.; migration, 5-201 illus. f.
Mallarmé, Stéphane (1842-98). Poet; leader of the Symbolists (*q.v.*); "L'Après-midi d'un Faune," "Vers et Prose," "Divagations."
Mallet, The. Type of articulated locomotive, 5-8.
Mallophaga (malof'aga). Sub order of insects including bird lice, 4-270.
Mallorca. See *Majorca*.
Mal'ory, George Leigh (1885-1924). Brit. mountaineer who, after making a record climb of 26,800 ft. up Mount Everest in 1922 was lost with Irvine during the expedition in 1924, when attempting the last few yards to the summit.
Mallow. Flower, 5-97.
Malmédy (mal'médé). Tn. and dist. in E. Belgium, 25 m. s.e. of Liège, coded with Eupen by Ger. in 1919.
Malmö (mal'mé). 3rd city of Sweden spt., airport, and industrial centre on s. coast; pop. 181,000; 7-201. ferry to Copenhagen.
Malory, Sir Thomas (d. 1471). Author of *Morte d'Arthur*, a collection of stories of King Arthur and his knights translated from Fr. sources, 5-97, 1-258, 3-284.
Malpighi (malpé'gi), Marcello (1628-94). It. physiologist, one of the first to apply the microscope to the study

MALPLAQUET

of animal and vegetable structure, and the first to attempt the anatomy of the brain; demonstrated blood circulation, 1-493, 5-195.

Malplaqet [malplah'kã]. Fr. vil. near Belgian frontier, scene of Fr. defeat by Marlborough in 1709; 5-132.

Malraux [malrô], André (b. 1895). Fr. writer; fought on Repub. side in Sp. Civil War, and in Fr. army in 2nd World War; mla. of information in de Gaulle govt. 1945-46; novels include *Days of Hope*, *Man's Fate*.

Malström. See *Maelström*.

Malt. Barley or other grain that has been artificially sprouted by moisture and heat; used in brewing, 5 97, 7-136, 1-369, 7-512; in making whisky, 7-136.

Malta. Brit. colony in Mediterranean, naval base; comprises three islands of Malta, Gozo, and Comino; total area 122 sq. m.; total pop. 307,000; 5-98.

Maltase. Starch-digesting enzyme of saliv.

Maltose Cross, 2 535.

Maltose Language, origin, 5-98.

Maltose Silk Laco, 4-131 illus.

Maltose Terrier. One of the oldest and most intelligent breeds of pet dog. Coat white, long, silky. Eyes and nose black. Belongs to spaniel breed.

Malthus, Thomas Robert (1766-1834). Brit. economist and author of "Malthusian theory, 3 411, 3-160.

Malthusianism. The theory advanced in Malthus's *Essay on Population* "that population, increasing in geometrical ratio, tends, unless checked, to outrun subsistence which increases in arithmetical ratio.

Maltose. A sugar, 7-136.

Malvern or Great Malvern. Tn. in Worcs, Eng.; pop. 21,080; on E. side of Malvern Hills; famous public school; festival of drama, 7 19.

Malvern Hills, Eng. Hill range extending about 9 m. between Herefordshire and Worcestershire; 7 476, 3 247, 4 168.

Mamaluco. People of mixed Amer. Indian and Portuguese blood in Brazil, 2-48.

Mam'lukes. Fighting slaves of Egypt who served the sultan as mounted soldiers, and in 1260 overthrew the rule of the Caliphs and made one of their own number sultan; 3-176.

Mammals. Vertebrate animals which suckle their young, 5-100; egg-laying, 3-172; development in geological periods, 3-516; hair, 4-117; compared with Man, 3-323; marsupials, 5-137; ruminants, 6-471.

Mammee Fruit, and apricot, 1-186.

Mam'mon. (Aramaic *mamona*). Phoenician term for gain. In New Testament it implies love of money.

Mammoth and Mastodon. A hairy elephant-like animal, now extinct, 5-103; fossil remains, 3-425.

Mammoth Cave. The most famous of the underground caverns in Kentucky, U.S.A., 4-399, 2-281 illus.

Mammoth Hot Springs. Yellowstone National Park, U.S.A.; there are altogether about 70 springs, 7-513.

Mam Soul. Mt. in Ross and Cromarty, Scot.; 3,862 ft., 6-455.

Man, 5 104; anatomy, 1-143; animal kingdom, 1-154; and apes in evolution, 1 179; birds' anatomy contrasted, 1-31; bone and skeleton, 1 318, 7-60; brain compared with that of animals, 2-40; brown eyes as dominant colour, 4-168; embryo 3-241; field of vision, 3-334 diag.; food, 3-408; genealogical tree, 3-323 diag.; geography as study of, 3-514; hair, 4-117, 4-118; heredity, 4-168; lake-dwellings, 4-440; and mammalian evolution, 3-323; migration, 5-203; dependence on plants, 4-469; physiology, 6-189; races of mankind, 6-333.

Man, Isle of. In Irish Sea; area 221 sq. m.; pop. 54,499; 5-110; Tourist Trophy races, 5-275, 274 illus.

Manado. Tn. of Celebes, Indonesia; pop. 27,000; 2-286.

Management. In economics, 3-160.

Managua [manah'gw]. (Cap. and 2nd city of Nicaragua, Cent. Amer., 30 m. from Pacific coast; almost destroyed by earthquake in 1931; pop. 107,444; 5-430.

Managua, Lake. Nicaragua, 32 m. long and 10 to 6 m. wide, 5-430.

Manamah. Cap. of the Bahrain Is., Persian Gulf; pop. 30,000; 6-135.

Manaoe [manah'oe]. City in N.W. Brazil on Rio Negro, 10 m. from the Amazon; pop. 110,000; 2-19.

Manasseh [manas'eh]. One of Hebrew tribes descended from Manasseh, elder son of Joseph, occupied cent. Palestine E. and W. of r. Jordan.

Manatee, or *Sea Cow*. An aquatic animal, belonging to the order *Sirenia*, from 8 to 10 ft. long; has no hind limbs, but the front flipper-like limbs are used with great dexterity; found on W. coast of Africa and E. coast of Cent. and S. America; the very similar dugong is confined to Indian Ocean; this has a forked tail.

Manchester. Inland port city, and textile mfg. centre in Lancs, Eng.; pop. 703,175; 5 111; cotton industry, 3-218.

Manchester. New Hampshire, U.S.A.; largest city and mfg. centre in state; pop. 82,732; cotton mfgs.; 5 398.

Manchester, University of. The original Owen's College was founded in 1831, and in 1880 became a constituent college of a new foundation, Victoria University, which in 1903 was reorganized; facilities include arts, commerce, law, science, music, theology, medicine, 5-112.

Manchester Grammar School, 5-112.

Manchester Ship Canal. Artificial waterway of Eng., running from Eastham, Cheshire, to Manchester, 35 m. long. Constructed 1887-93. 2-207, 5-111.

Manchets. Loaves, in medieval diet, 5 152.

Manchu [mancho'v] Dynasty, rulers of China from 1644-1912. Invasion of China, 2-373, 5-112.

Manchukuo. Puppet state set up by Japan (1932-45), embracing Manchuria and Jehol, 5-112.

Manchuria. Region in N.E. China, once the home of the Manchus; called Manchukuo (1932-45) when it was a Jap. puppet state; area 295,000 sq. m.; 5 112; occupied by Japs., 4 350, 1 277, invaded by Russia, 7-498.

Mancunium. Rom. tn. on site of Manchester, Eng., 5-111. Manchester people are sometimes referred to as Mancunians.

Mandalay [man'delã], cap. of Upper Burma, on r. Irrawadi; pop. 165,000; silk mfgs.; 2 130.

Manda'mus (Latin, "we command"). A writ issued by a superior court ordering an official, corporation, or inferior court to perform a public duty as required by law.

Mandarin Duck, 3-132 illus. f.

Mandarin Orange. Variety of orange, 5-524.

Mandarins. Chinese officials, 2-405 buttons as badges of rank, 2-146.

Mandatory or Mandated Territories, former Ger. colonies and parts of Turkish Emp., assigned at close of 1st World War to various powers to be held under mandates (Treaties of trust) for League of Nations. These territories (total pop. 13,000,000) were assigned as follows:
To Gr. Brit.: Iraq (became independent in 1927), Palestine (p.r.), Nauru Isl., parts of Togo, Cameroons, German East Africa (Tanganyika Territory).
To Union of South Africa: South-West Africa.
To France: Syria (became independent in 1943), parts of Togo and Cameroons.
To Belgium: small parts of German East Africa.
To Australia: German New Guinea and adjacent isls.
To New Zealand: German Samoa.

MANISSA

To Japan: All German Isls. in Pacific N. of Equator (after 2nd World War admin. by U.S.A.) under U.N. trusteeship.

To Greece: Smyrna, which Turkey reconquered.

Remaining Belgian, Australian, New Zealand, French, and U.K. (but not S. African) mandated territories were placed under U.N. trusteeship after 2nd World War.

M and B. Initials of firm of manufacturing chemists, May and Baker, used as name of series of sulphur drugs, the best known being M & B 693 (sulphapyridine); 7-186.

Man'deville, Sir John (John de Mandeville). Reputed writer of a 14th cent. book of travels.

Mandingo. A large group of Negroes mixed with Hamites, dwelling in W. Africa from the r. Senegal to Liberia and numbering millions.

Mandolin. Stringed musical instrument played by striking the metal strings with a piece of bone or metal called a "plectrum," a favourite in Spain and Italy, 5-309.

Man'drake or Mandragora. Plant of the nightshade family found chiefly in the districts bordering the Mediterranean Sea; one of the most important plants in the folk lore of Europe, and in the herbs of the Middle Ages; 1-142.

Mandrill. Largest and fiercest of the baboons, 5 212, 210 illus. f.

Mandrioli Pass. N. Apennines, Italy, 4-308 illus.

Manet [mahné], Edouard (1832-83). Fr. painter, pioneer and most important master of Impressionism (not to be confused with Claude Monet); called most original painter of later 19th cent., 3-140, 4 237.

Man'etho. Egypt. historian of 3rd cent. B.C.; fragments of his work survive in Josephus.

Mangabey. Monkey, 5-210 illus. f.

Mangan, James Clarence (1803-49). Irish poet ("Romances and Ballads of Ireland"; "The Nameless One," an autobiographical ballad); a world genius who sincerely expressed the tragedy of Irish aspirations, 4-287.

Manganese (Mn). A soft grey metallic element; atomic no. 25; atomic weight 54.93; melts at 1242° C.; 5 112, 3 221.

Manganese Bronze. An alloy; uses, 5-112.

Mangel, type of beet, used for cattle fodder, 1 111.

Mango. Fruit of the mango tree which grows in the tropics, 5 113.

Mangold (Beet). See *Mangel*.

Mangonel. Roman catapult, 1-258.

Mangosteen. Tropical fruit, 3-479.

Mangrove. Tropical swamp tree, 5-113; in Niger delta, 5 435.

Manhattan Island. One of the five boroughs of New York City and the centre of its business, finance and entertainment, 5 410, 411 illus., 413° illus., 418 illus.; as a Dutch colony, 1-139.

Manila. Cap. of Philippine Islands, on Luzon Isl., at mouth of Pasig river; pop. 1,180,500; 5-113.

Manila Bay, Philippine Isls., large inlet of China Sea in Isl. of Luzon.

Manila Hemp, 4-161, 6-157 6-151.

Manili'us, Gaius. Rom. tribune of the people in 66 B.C., whose proposal to give Pompey supreme command and unlimited power in the war against Mithridates was supported by Cicero in the famous oration "De lege Manilia."

Manioc [man'jok], or *Cassava*, plant from which tapioca is obtained, 7-226, 6-76.

Maniple. Unit of Roman army, 1-246.

Manipur. State of Rep. of India; area, 8,620 sq. m.; pop. 579,058. cap. Imphal; 4-241.

Manisa or Manisa. City in W. Asiatic Turkey; pop. 38,000; anc. Magnesia, where Rom. consul Scipio Asiaticus defeated Antiochus the Great 190 B.C.

MANITOBA

Manitoba. Prairie prov. of Canada; 246,619 sq. m.; pop. 776,541; cap. Winnipeg; 5-14, 7-461.
Manitoba, Lake, in s.-cent. Manitoba, Canada; length 110 m.; drains into L. Winnipeg, through Dauphin r.; 5-114.
Mann, Heinrich Ludwig (1871-1950). Ger. writer, brother of Theo. Mann. Wrote satirically of Ger. petit-bourgeois servility. Went to U.S.A. 1933. Works include *Professor Unrat* (filmed as *The Blue Angel*) and *Madame Legros*.
Mann, Thomas (1875-1955). German writer who became an American citizen. Won Nobel prize for literature in 1929. Works include *Buddenbrooks*; *Death in Venice*; *The Magic Mountain*; 4-14.
Mann, Tom (1856-1941). Brit. socialist and labour leader; prominently associated with the organization of the dock labourers following the strike of 1889; took leading part in many strike movements.
Man'na. In the Bible, food on which Israelites lived in wilderness; said to have rained from Heaven (Exod. xvi), but probably the secretion of a species of tamarisk tree when attacked by a scale insect.
Manna Ash, a tree, *Fraxinus ornus*, exuding a sugary "manna" for which the tree is grown in Sicily and elsewhere.
Mannerheim, Gustavus Charles, Baron (1869-1951) Finnish F.-M. and pres.; led army against Russ. 1939-40 and 2nd World War, 1941-44; made pres. Aug. 1, 1944, resigned in 1946.
Manners, 5-115; and etiquette, 3-302.
Mannheim. Commercial city of W. Ger. on upper Rhine, in the Land of Baden-Württemberg; motor vehicles, wood-pulp, paper, chemicals, textiles and rubber are chief products; pop. 212,000.
Manning, Henry Edward, Cardinal (1808-92). Eng. High Church leader became Rom. Cath. (1851) and cardinal (1875); ardent supporter of doctrine of papal infallibility; and Newman, 5-399.
Manningtree. Tn. in Essex, Eng.; trade in malt and wheat; pop. about 800; 3-298.
Manoel. Kings of Portugal. Manoel I (reigned 1495-1521), 1-132; Manoel II (1889-1932), crowned in 1908, dethroned in 1910, 6-269.
Man-of-war Bird. See Frigate Bird.
Manolets (1917-1947). Greatest Span. bull-fighter of modern times, 2-121.
Manon. Opera by Massenet; story, 5-518.
Manon Lescaut, Opera by Puccini, 5-518.
Manono. Isl. of the Brit. Western Samoan group, 6-494.
Manor House as development of castle, 2-261.
Manorial System in medieval agriculture, 1-77, 70 diag.; common, 2-473.
Mansard, in architecture, a style of roof, also called the Fr. curb, or hip roof, to make the attics available as rooms.
Mansfield, Katherine (1890-1923). Brit. author, especially of short stories; b. in N. Zealand; married John Middleton Murry; 2-291.
Mansfield. Tn. in Nottinghamshire, Eng.; pop. 51,343; hosiery, shoes, machinery and textiles are chief products; 5-468.
Mansfield, Mount. Highest peak (4,364 ft.) in the Green Mountains, Vermont, U.S.A., 7-392.
Mansion House, London, the official residence of the Lord Mayor of London, 5-20.
Manson, Sir Patrick (1844-1922). Brit. physician and writer on tropical diseases; malaria research, 5-163.
Mannstein, Fritz Erich von, F.-M. (b. 1887). Ger. army officer commanding troops of Crimea and Sebastopol in 1941; F.-M. in 1942 on S. Russian front; dismissed in 1944; captured by Allies, 1945. In 1949 tried as a war criminal and sentenced to 18

yrs. imprisonment, later reduced to 12. Released 1953.
Massara (massoraa). Eg. tn. on Nile delta 70 m. N. of Cairo; pop. 69,000; cotton trade and intra-battle between Crusaders under Louis IX of Fr. and Saracens in 1250; Louis imprisoned.
Maestras, Andrea (1431-1506). It. painter, 4-318.
Mantidae. The mantis family of the order Orthoptera, 5-116.
Mantilla. Lace headdress or veil worn by Span. and Port. women on ceremonial occasions, 7-110 illus.
Mantinae (mantinai). Battle of (362 B.C.), between Thebes and Sparta, 7-267.
Mantis. An orthopterous insect, 5-116.
Mantissa in logarithms, 5-17.
Mantling, in heraldry, 4-165.
Mantua (mant'wood) (It. Mantova). Fortified tn. in N. It. 80 m. s.w. of Venice; pop. 40,000; home of Virgil; held by Fr. (1797-99, 1801-14), by Austria (1814-66); in German hands 1943-45.
Manu, Code of. Hindu collection of legal writings; and origin of Indian castes, 4-251.
Manual, of organ, 6-1.
Manubrium. Ring of tissue guarding the mouth of a jelly-fish, 4-360.
Manuscripts, illuminated, 5-116, 2-3; of Bible, 1-441; Book of Kells, 2-2 illus.; of 9th cent., 7-503 illus.; and infra-red photography, 4-261.
Manutius [man'ushius]. It. family of printers, who flourished during 16th cent.; their press called Aldine, from Aldus, the founder. See Aldus Manutius.
Manx Cat, 5-110, 2-262 illus.
Manx Shearwater. Sea bird, 7-20; homing instinct, 4-189.
Manyples, or Psalterium. Third stomach of a ruminant, 6-471.

MARASCHINO

Marasnares. R. of Spain; Madrid on, 5-72.
Marsani, Alessandro (1785-1873). It. poet and novelist, 4-330.
Marsia. Native people of New Zealand, 5-425; and taboo, 5-79 illus.; tattooing, 7-230 illus.
Mao Tse-tung (b. 1894). Chinese Communist leader, 2-375, 5-112.
Maple. Tree, 5-117; cork, 2-505; seeds, 5-329 illus.
Maple Leaf for Ever, The. Canadian national song, 5-117.
Maple Syrup, source of, 5-117.
Map-reading, by the blind, 1-486 illus.
Maps and Map-making, 5-118.
Maquis (maké). Originally extensive thickot-covered areas resorted to by Corsican brigands; in 2nd World War name given to Fr. and Belg resistance movements against Ger occupation; 7-495.
Maracaibo (maraki'bó). Chief port of Venezuela, in n.w. on channel between Gulf of Venezuela and L. Maracaibo; pop. 232,488; exports: coffee, cocoa, hides and skins and dye woods; centre of big oil industry, 7-385.
Maracaibo, Gulf of. See Venezuela, Gulf of.
Maracaibo, Lake. In n.w. Venezuela opening through a long neck into Gulf of Venezuela; s. half of lake is fresh, but n. half, under tidal influence, is brackish; 7-385.
Marais, Eugene (1872-1936). S. African writer, 7-84, 1-66.
Maramuresh (mahramoresh') or Marmaros, dist. in n.w. Rumania, formerly Hungarian co.; 6,258 sq. m.; pop. 767,000.
Marañon. Largest riv. in Peru length 500 m. Forms upper course of Amazon, 1-129, 6-138.
Maraschino. Liqueur prepared from the Maraschino cherry. Cherries are

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MARAT

unleaded, honey or sugar being added. The liquor is distilled to produce a drink 35 per cent. alcohol.

Marat, Jean Paul (1743-93). Fr. revolutionary, 5-120, 3-468; portrait, 3-468.

Marathi. Language of India, 4-241.

Marathon, Battle of (490 B.C.), 6-130, 1-327, 7-268.

Marathon, The. Foot race in Olympic games over a distance of 26 m. 385 yds.; origin, 5-510, 1-290.

Marble. A limestone rock, 5-120, 121 illus. f., 4-510; quarry, 6-319 illus.

Marble Arch, London. At the north-east corner of Hyde Park, modelled on the Arch of Constantine, Rome, for George IV at a cost of £80,000, and brought from Buckingham Palace in 1851; designed by Nash, the relief carved by Westmacott; 2-104, 5-26 illus.

Marbled White Butterfly, 2-139 illus.

Marboré. Mt. in Pyrenees, 10,673 ft., 6-313.

Marburg (mahr'boorg). Ger. Tn. in the Land of Hessen, famous for univ. (founded 1527, first univ. established without papal privileges), 13th-cent. church containing tomb of St. Elizabeth of Hungary and its 13th-cent. castle. Pop. 28,000.

Marcanтонио (c. 1488-c. 1537). Foremost It. engraver in the Renaissance, first to copy on copper the work of other artists (Dürer's Little Passion and Life of the Virgin; countless drawings and paintings by Raphael).

Marcasite. Mineral; crystals, 5-213 illus. See also *Stones, Precious* (11st).

Marcellus, Marcus Claudius (c. 268-208 B.C.). A Rom. gen. in 2nd Punic War, conqueror of Syracuse; five times consul; killed near Volsuni.

March. Tn. in Cambridgeshire, 15 m. N.W. of Ely; mfrs. machinery; pop. 11,000.

March. Third month of the year; origin of name, 5-255.

Marchand, Jean Baptiste (1863-1934). Fr. army officer, who came into prominence in 1898 when he refused to withdraw from Fashoda (in the Sudan) at the request of General Kitchener, leaving later on the order of the French government; served with distinction in 1st World War.

Marchand, Jean Louis (1669-1732). Fr. organist; and Bach, 1-310.

Marches, The. Territorial division on E. coast of cent. It., formerly part of Papal States, 4-304.

Marches, Welsh. Counties in England bordering on Wales, containing remains of many castles built to withstand raiders.

Marching through Georgia. Popular song of Amer. civil war; origin of song, 4-512.

March Moth. One of the destructive moths, 7-462.

Marconi, Guglielmo (1874-1937). It. inventor of radio telegraphy, 5-122; experiments in telegraphy, 5-342, 343; first radio transmitter, 6-340 illus.

Marconi Company, trial broadcast programmes, 6-346.

Marconigram, early name for a radio telegram, 6-343.

Marob Polo's Sheep, 7-20.

Marous Antonius. See *Mark Antony*.

Marous Aurelius Antoninus (121-180). Rom. emperor, 181-180, 5-123, 6-439; equestrian statue, 6-441 illus.

Mardi Gras (mahr'dé'grah), or Shrove Tuesday. Day of carnival with battles of flowers and similar gaieties in certain countries; in New Orleans, 5-400, 401 illus.

Mare Caspium. Rom. name for Caspian Sea, 2-256.

Mare Claus'um. In international law, sea or portion of sea which is under the jurisdiction of one nation instead of open to all.

Marée-Loch. Fresh-water loch in Ross and Cromarty, Scot., 6-510, 6-455.

Mare Hyrcanum. Rom. name for Caspian Sea, 2-256.

Marengo. Vill. in N. It. 35 m. N.W. of Genoa; battle of (1800), 5-319.

Marex of Diomedes. In Gk. myth., monsters captured by Hercules, 4-166.

Maréchal Lina. Fr. system of defence in E. of Tunisia, N. Africa; about 20 m. long; from coast nr. Zarai, through Maréchal tn. to Matmata Hills; defended by It. and Ger. forces; broken by Allies Mar. 28 1943; 7-493.

Maréy, Etienne Jules (1830-1904). Fr. physiologist; devised photographic methods of recording the motion of wings of insects and birds.

Marganz, S. Wales; iron-works, 4-295.

Margaret, St. (c. 1045-93). Queen of Malcolm III, king of Scotland; daughter of the Rng. prince Edward, son of Edmund Ironside; probably b. in Hungary; canonised in 1251 on account of her great benefactions to the Church, 3-164.

Margaret (1353-1412). "Semiramis of the North," queen (governing as regent for nominal sovereigns) of Denmark, Norway, and Sweden; union of Kalmar, 3-74.

Margaret (1430-82). Queen of Henry VI of Eng.; leader of the Lancastrian party in Wars of the Roses, 4-163, 6-454.

Margaret (b. 1930). Brit. princess, sister of Queen Elizabeth II, 5-124.

Margaret of Valois or *Angoulême* (1492-1549). Queen of Henry d'Albret, king of Navarre, and sister of Francis I of Fr., joint author of the *Heptameron*, stories modelled on the *Decameron* of Boccaccio; patroness of Marot and other literary men, and protector of Protestants; sometimes called Margaret of Navarre to avoid confusion with her grand-niece.

Margaret of Valois (1553-1615). Daughter of Henry II of Fr. and Catherine de' Medici, married to Henry (Bourbon) of Navarre (afterward Henry IV of Fr.) on eve of Massacre of St. Bartholomew; 4-164.

Margarine. Butter substitute, 5-124.

Margate. Popular seaside resort in Kent, on Isle of Thanet, 74 m. E. of London; pop. 42,480; 4-398.

Marggraf, Andreas Sigismund (1709-82). Ger. chemist; discovered (1747) sugar in beet, 7-184, 1-410.

Marguerite (mahr'grét'). Popular name of several familiar flowering plants, such as the China aster ox-eye daisy, etc.; pollen grain, 3-399 illus.

Marl. Autonomous republic of U.S.S.R. within the R.S.F.S.R., lying N.W. of Kazan; fertile plain watered by the Volga; pop. 482,000.

Maria II, de Gloria (1819-53). Queen of Port.; succeeded in 1826 on abdication of her father, Dom Pedro; reign troubled by rebellion of uncle, Dom Miguel, and insurrections.

Mariana Islands. Isl. group in the Pacific; about 1,500 m. E. of the Philippines; 440 sq. m.; formerly part of Ger. New Guinea; mandated to Japan between World Wars; in 1946 U.S.A. given U.N. trusteeship of the group; 6-26.

Marianne (1717-80). Empress of Austria, 5-125; War of Austrian Succession, 1-326, 3; Frederick the Great and, 4-8; accession by Pragmatic Sanction 4-130.

Maria Theresa (1639-83), of Spain. Queen of Louis XIV.

Marié (1875-1938). Queen of Ferdinand I and mother of Carol II of Rumania.

Marié Antoinette (1755-93). Queen of Louis XVI of Fr., 5-125; influence on Louis, 5-43; her extravagance, 3-467; at Versailles, 7-394; Lafayette rescues, 4-437; portrait, 5-126 illus.

Marié Byrd Land. Portion of the Pacific sector of Antarctica; discovered by Rear-Admiral Byrd in Feb. 1929, 2-147.

Marié Celeste (more correctly *Mary Celeste*). Amer. brigantine, the fate

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of whose crew remains the greatest mystery of the sea; she was found in mid-Atlantic in Nov. 1872, a month after sailing from New York; although in perfect order, and under full sail, there was not a soul on board.

Marie de' Medici. See *Medici, Marie, de'*.

Marie Galante (galahnt'). Isl. of Fr. W. Indies; dependency of Guadeloupe; 60 sq. m.; pop. 14,327.

Marie José. Consort of Umberto II of Italy, daughter of Albert I of Belgians.

Marie Louise (1791-1847). Second wife of Napoleon and Empress of the Fr., 5-320, 4-384, 2-28.

Marlenbad (Marianske Lazne). A celebrated watering-place near w. border of Czechoslovakia; mineral springs.

Marlenburg (Pol. Malbork). Former Ger. city of E. Prussia on r. Nogat, and since 1945 in Poland.

Mar. Its pop. of 21,000 were expelled when Poles took over admin.; seat of Teutonic knights (1309-1457); machinery and cotton mfrs.

Marignac (marényak). Jean Charles Galissard de (1817-91). Swiss chemist, prof. at Geneva; work on atomic weights and rare earths; discovered element ytterbium.

Marignano (marényah'no) or *Melegnano*. Tn. in N. Italy 10 m. S.W. of Milan; victory of Francis I over Swiss allies of Milan (1515).

Marigold. Flower belonging to the bot. order *Compositae*, 5-126.

Marjuna (drug). See *Indian Hemp*.

Marine engineering, as a career, 2-238.

Marine. Merchant Navy, 5-172.

Marine Life, 5-127.

Marinetti, F. T. (1876-1944). It. writer; and Futurism movement in art, 4-320.

Marini (maré'ni). Giovanni Battista (1569-1625). It. poet ("L'Adone"); style stilted and bombastic.

Marinus, St. Legendary founder of San Marino.

Marionettes, compared with glove puppets, 6-311, 310 illus.

Marlotte (marlot'). Edmé (c. 1620-84). Fr. physicist, independent discoverer of Marotte's law or Boyle's law.

Maria, Jacob (1837-99). Dutch painter, 5-384.

Maria, Matthew (1839-1917). Dutch painter, 5-384.

Maria, Willem (1843-1910). Dutch painter, 5-384.

Mariachal College, Aberdeen univ., 1-5.

Marianna. Opera by Vincent Wallace 5-518.

Marius (c. 155-86 B.C.). Rom. military leader; rivalry with Sulla, 6-433.

Marjoram. Aromatic perennial plant, family *Labiatae*. Brit. species is *Origanum vulgare*, height 1-2 ft., purple flowers in clusters. Dried shoots and stems used for flavouring in cookery.

Mark, St. Traditional author of the second Gospel, accepted by most scholars as the oldest of the existing Gospels.

Mark, Antony (c. 82-30 B.C.). Rom. statesman and soldier, 5-129; and Cleopatra, 2-407; and Octavian, 1-309.

Mark. Former silver coin, monetary unit of Germany, consisting of 100 pfennig; nominal value of the Reichsmark about 11½d.; after 1st World War greatly depreciated and in 1923 practically lost all value, many millions being obtainable for £1, later stabilised; lost value after 1945; June 1948 currency changes and cancellation of Reich debts altered value of mark; in Dec. the exchange rate of new D.M. (Deutsche Mark) was 12:35 to the £; in 1953 the exchange rate was 11:75 D.M. to the £.

Market Bosworth. Tn. Leics, Eng.; pop. about 1,100; 2 m. N. of site of Battle of Bosworth (1485), 4-476.

Market Drayton. Tn. in Shropshire, Eng., 18 m. N.E. of Shrewsbury, on r. Tern; agricultural centre; pop. 5,630, 7-44.

Market Gardening, 5-129.

Market Harborough. Tn. in Leics,

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Eng., 16 m. S.E. of Leicester; hunting centre; infra. boots and shoes; pop. 10,400, 4-476.

Markham, Sir Clements (1830-1916). Brit. geographer, for more than 60 years himself an active explorer and traveller, and instrumental in the exploration of uncharted areas; funds for Scott's South Polar voyage raised almost entirely by his efforts.

Markievicz [markivich], **Constance, Countess** (1884-1927). Irish politician, wife of a Polish count whom she married in 1900; took a prominent part in Irish industrial affairs and the rebellion in April 1916, for which she was sentenced to death, but pardoned; became first woman member of U.K. Parl. in 1918, but did not take her seat.

Marking-ink, 4-262.

Markka. See **Money** (list).

Marl. Soil consisting of clay and lime.

Marlborough, John Churchill, 1st Duke of (1650-1722). Eng. general and statesman, 6-131; at Battle of Blenheim, 1-484.

Marlborough, Sarah Jennings Churchill, Duchess of (1660-1744). Wife of 1st Duke, and favourite of Queen Anne, 6-131, 4-158.

Marlborough College, Wilts. Eng. Public school founded in 1843; originally for sons of clergymen.

Marlborough Downs, Wilts. Eng. Hills lying in a valley of the chalk uplands on the edge of Savernake Forest, traversed by the r. Kennet.

Marlborough House. Royal residence in Pall Mall, London; built for the Duke of Marlborough in 1710 by Christopher Wren. It became the London residence of the Prince of Wales, 1863-1901; George V, 1901-10; Queen Alexandra, 1910-25; Queen Mary, 1936-53.

Marline. See **Nautical Terms** (list).

Marline-spike. See **Nautical Terms** (list).

Marlowe, Christopher (1561-93). Eng. poet and dramatist, 5-133, 3-285; 3-118; *r. Faustus*, 3-313; *Tamburlaine the Great*, 5-238.

Marmalade. A preserve made from oranges, lemons, or grapefruit, 4-337.

Marmara [mahr'mara]. Sea of. An. Propontis, sea between European and Asiatic Turkey; map, 7-333.

Marmoset. Smallest S. Amer. monkey, 5-240 illus. f.

Marmot. A burrowing rodent; fur, 3-496.

Marne. Tributary of r. Seine; scene of two battles in 1st World War, 7-482, 7-478, 7-188, 6-530.

Marot [mah'rō], **Clement** (1496-1511). Fr. poet; introduced new grace into stiff forms of Fr. poetry; his translation of Psalms greatly advanced Reformation in France, 3-453.

Marquand, John P. (b. 1893). Amer. novelist, 7-366.

Marquesas (mahr'kāsas), or **Mendana Islands**. 11 volcanic Polynesian isls.; in mid-Pacific, 4,000 m. W. of Peru; 480 sq. m.; natives, 6-28; hair style, 6-25 illus.; pearl fishers, 6-102 illus.

Marquess. Eng. nobleman next in rank below a duke, 6-106.

Marquetry Work. Mosaic of ornamental woods, metals, or ivory used in furniture making, 3-492 illus.

Marquette, Jacques (1637-75). Fr. explorer and missionary; with Joliet sailed down the Mississippi r. to mouth of Arkansas r. in 1673, 5-227, 1-136, 4-399.

Marrakesh or Morocco City. Moroccan city in Fr. zone; pop. 241,000; 5-265 illus.

Marram-grass, for sand dunes, 5-372, 6-496 illus.

Marriage, 5-133; bridal procession, 5-465 illus.; between cousins, 5-169; Royal Marriage Act, 6-463.

Marriage à la Mode. Hogarth's painting, 4-185 illus.

Marriage of Figaro, The. Opera by Mozart, story, 5-510.

Marriage of Giovanni Arnolfini, The. Painting by Jan Van Eyck, 5-381.

Marrow, Vegetable, 5-135.

Marrow, in bones, 1-489, 7-81.

Marryat, Frederick (1792-1848). Brit. naval captain and novelist, 5-136; sea stories, 2-356; system of flag signals, 7-52.

Mars. Rom. god of war; identified with Gk. god Ares, 5-136, 5-255.

Mars. A planet, 6-212, 5-136; atmosphere of, 1-82; in solar system, 1-282, 278 diag.

Marschner, Heinrich (August) (1795-1861). Ger. composer, 5-514.

Marseillaise, La. Fr. national anthem, 5-326, 5-137.

Marseilles. Second city and chief pt. of France; pop. 836,264, 5-136, 3-432, 3-438; docks, 5-435 illus.; "La Cité Radieuse", 4-174 with illus.; Rhône-Marseilles canal, 6-395.

Marshall, Benjamin (1767?-1835). Brit. painter of sporting subjects, especially horses; many engraved by John Scott. Lived chiefly at Newmarket.

Marshall, George Catlett b. (1880). Amer. soldier and statesman, 5-137; Marshall Aid, 7-363.

Marshall Islands. 24 Micronesian isls. in N. Pacific, E. of Caroline Is.; area 160 sq. m.; pop. 10,000; export copra. Admin. by U.S.A. under U.N. trusteeship since 1947, 6-26; in 2nd World War, 7-104.

Marshal of the R.A.F. Highest commissioned rank in R.A.F. Insignia one broad (black bordered), four narrow rings on cuff or epaulette, 6-463.

Marshalsea Prison. Former London prison in Southwark. Originally prison of the court of the knights marshal for settlement of disputes among royal servants. Mentioned in 14th cent. records. Later used for felons, pirates and debtors. Pulled down 1780, rebuilt 1811; used until 1819, demolished 1887. Depicted by Dickens in *Little Dorrit*, 6-291.

Marsh Frillilary, butterfly, 2-141 illus.

Marshmallow. Sweetmeat; origin of name, 5-97.

Marsh Marigold. Flower of the *Ranunculus* family, 5-126, 2-24 illus. f.

Marsh Orchis, a common Brit. orchid, often found in moist meadows; large leaves, sometimes spotted, and spikes of bright purplish flowers; several varieties.

Marsh Willow-herb. See **Willow-herb**.

Marston, John (1576-1634). Eng. playwright and satirist; was ordained in 1609 and wrote no more for theatre, 3-285.

Marston Moor. Plain in Yorkshire. Eng. 8 m. from York; battle of (1644), 2-307, 2-278, 2-531.

Marsupials. Mammals with pouch for young, 5-137, 5-103; kangaroo, 4-301; koala, 4-424; opossum, 5-521.

Marsyas. A satyr; and Apollo, 1-183.

Martello Towers. Round towers once used in Eng. for coast defence; some still remain on S. coast; erected during scare of Napoleon's threatened invasion in 1804. Name derived from fort at Mortella Point, Corsica, from which they were copied.

Marten. Animals of the weasel family, 5-137; fur, 3-196.

Martha. Sister of Lazarus and Mary, and friend of Jc. (Luke x, 38).

Martial [mahr'shol]. Anglicised name of Marcus Valerius Martialis (c. 43-c. 101), greatest Rom. epigrammatist, 4-451.

Martin. St. (c. 316-400). Roman soldier who became bishop of Tours; founded first monastery in France; festival Nov. 11, known as Martinmas, a quarter day in Scot.

Martin (popes). For list see **Pope**.

Martin, Emile and Pierre. Fr. inventors of the open-hearth furnace, 4-204.

Martin, Richard ("Humanity Dick") (1754-1834). Irish humanitarian; sat in Irish parl., also in U.K. parl. 1801-26 where in 1822 carried first law in any country for protection of animals; in 1824 founded R.S.P.C.A.

Martineau [mahr'tēnō], **Harriet** (1802-76). Brit. novelist and writer on

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miscellaneous subjects; *Letters on the Laws of Man's Social Nature*, 4-439.

Martineau, James (1805-1900). Prominent Brit. Unitarian minister and essay writer; eminent philosopher, brother of Harriet Martineau.

Martinez Ruiz [mō'b'ēth], **José** (b. 1874). Sp. writer, known also by pseudonym Azorin, 7-122.

Martinez Sierra [mahritēneth sē'a'ra], **Gregorio** (1881-1947). Sp. dramatist and novelist, collaborated with his wife, Maria de la Lejarraga, 7-122.

Martin-Harvey, Sir John (1867-1941). Brit. actor, played in company with Henry Irving and Mrs. Patrick Campbell; his greatest success was as Sydney Carton in *The Only Way* a character he created.

Martini [mahritē'nē], **Giovanni Battista** (1706-84). It. musician, famous as teacher of composition and theory.

Martini, Simone (1283-1314). It. artist, member of Sienese school, 4-317.

Martinique. Isl. in West Indies; rank as a dept. of Fr.; area 385 sq. m.; pop. 264,219, 5-139; Mont Pelée, 7-405 illus. f.

Martins. Birds of the swallow family, 7-198.

Martys, Christian, 5-138.

Marvell, Andrew (1621-78). Eng. poet and satirist; under Restoration attacked Charles II and advocated a republic; remembered now for his lyrics, 3-285; lines on Charles I, 2-307; and Milton, 5-210 illus.

Marx, Karl (1818-83). Ger. socialist, founder and leader of Marxist socialism, 5-139, 2-474, 7-81.

Marx Brothers. Amer. film comedians; originally four: Arthur (Harpo), b. 1893, Julius (Groucho) b. 1893, Leonard (Chico) b. 1891, and Herbert (Zeppo) b. 1901. Number reduced to three by retirement of Zeppo. Films include *Monkey Business*, *A Night at the Opera*. Famous for a curious "surrealist" form of humour.

Mary I (b. 1515; reigned 1553-58). Queen of Eng., 5-140; loss of Calais, 2-166; and Elizabeth I, 3-230; and Lady Jane Grey, 4-98; and John Jarvis, 3-140; and Philip II, 6-155.

Mary II (1662-94). With her husband William III, joint sovereign of Gt. Brit., 5-140, 3-280.

Mary (1867-1953). Queen consort of George V of Gt. Brit., 5-140; at the Delhi Durbar, 4-253 illus.; doll's house, 3-105 illus. f.

Mary, Queen of Scots (1542-87), 5-141; at Buxton, 3-77; and Holyrood house, 3-164; at Loch Leven castle, 4-412 illus.; and Elizabeth I, 3-231; and John Knox, 3-124.

Mary (b. 1897). Brit. princess, only daughter of George V; married Viscount Lascelles, later 6th Earl of Harwood (1882-1947) in 1922. created Princess Royal in 1932; had two sons, George, 7th Earl of Harwood (b. 1923), and Hon. Gerald Lascelles (b. 1924).

Mary (1457-82). Duchess of Burgundy, restored lost rights to her Dutch subjects (thus paving way for Dutch independence).

Maryborough. See **Portloughish**.

Maryborough. Port in Queensland Australia, on r. Mary; rly. workshops and iron foundries; pop. 5,900, 6-324.

Mary Hare Grammar School. Newbury Berks, Eng.; for deaf pupils, 2-57.

Maryland. State of U.S.A.; area 10,577 sq. m.; pop. 2,343,000; cap. Annapolis, 5-143.

Marylebone Cricket Club (M.C.C.). 2-528; and lawn tennis, 4-460.

Mary Magdalene ("Mary of Magdala"). convert and devoted follower of Jesus (John xx).

Mary of Guise or Lorraine (1516-60). Queen of James V of Scot., later regent for her daughter, Mary Queen of Scots; arranged Fr. alliance, used Scot. to aggrandise Guise family; and John Knox, 4-424.

Maryport. Spt. of Cumberland, Eng.; pop. 12,237, 3-10.

MASACCIO

Masaccio [masah'chô] (1400-38). Nickname of Tommaso Guidi. It. painter; first to appreciate aerial perspective, to show figures in bold relief, and to introduce lively action into painting, 4-317.

Masai. Fierce people inhabiting part of Kenya, E. Africa, 4-399, 1-61; women's ornaments, 1-52 illus.

Masaryk, Jan Garrigue (1886-1948). (Czech statesman, son of Thomas Masaryk, 5-143.

Masaryk, Thomas Garrigue (1850-1937). (Czech statesman, educator and historian, 5-143, 7-183; and Benes, 1-428.

Mascagni [maskah'nyé]. **Pietro** (1863-1945). It. composer; wrote the opera *Cavalleria Rusticana*, 5-516, 515 illus.

Mascehra [maskahrah']. Fortified town in Algeria, about 45 m. S.E. of Oran, on slope of Atlas Mts.; stands on site of Roman colony; pop. 33,000.

Massefield, John Edward (b. 1878). Brit. poet, novelist, and dramatist, 5-144, 3-291; poet laureate, 6-232.

Maseru. Chief tn. of Basutoland, 7-89.

Mashonaland. Native territory in S. Rhodesia, 6-393.

Mask, Lough. Irish Rep., between counties of Galway and Mayo; about 12 m. in length and 2 to 4 m. in breadth; contains about 20 islands.

Maskelyne, John Nevill (1839-1917). Brit. conjuror, 2-485, 486.

Maskelyne, Nevill (1732-1811). Brit. astronomer, royal, founder of the *Nautical Almanac*, first published in 1766, and compiler of a catalogue of fundamental stars.

Masks, in Gk. tragedy, 3-116 with illus.

Maslin or Mashlum. Mixture of grain; in medieval agric., 1-71.

Masolino (1383-1447). It. painter; frescoes at Florence, 4-317.

Mason, Alfred Edward Woodley (1865-1948). Brit. author and playwright; his powerful novels gained a wide circle of readers (*The House of the Arrow*; *The Four Feathers*; plays, *At the Villa Rose*; *Running Waters*; *Fire Over England*).

Mason, Charles (1730-87). Brit. astronomer and surveyor; fixed precise measure of a degree of latitude in America.

Mason. Worker in stone; and freemasonry, 3-165.

Mason and Dixon Line. Boundary between states of Maryland and Pennsylvania, U.S.A. Drawn 1763-67 by astronomers Charles Mason and Jeremiah Dixon to settle a dispute. Line originally marked by stones every fifth mile. Until Amer. Civil War (1861-65) it marked part of the border between the free and slave states.

Mason Wasp, nest, 4-269.

Maspero [masperô]. **Gaston Camille Charles** (1846-1916). French Egyptologist; professor of Egyptology at Collège de France; headed government archaeological mission to Egypt in 1880.

Mass, in physics, 6-185; and atomic energy production, 1-300; principle of conservation of, in chemistry, 2-317; and energy in relativity, 6-381.

Mass. In Rom. Cath. Church, the celebration of the sacrament of the Eucharist, 6-427.

Massachusetts. One of the New England states, U.S.A.; area 8,257 sq. m.; pop. 4,690,514; cap. Boston, 5-144; Pilgrim Fathers, 6-200.

Massachusetts Bay. Arm of Atlantic indenting E. coast of Mass., U.S.A., 40 m. long, 5-144.

Massage [massahzh'] (from Gk. word for "knout"), and manipulation of joints. Method of treatment, using the hands, for the alleviation of bodily conditions, 6-193.

Massalia. Gk. settlement on site of Marseilles, 6-137.

Massawa [masah'wa]. Spt. and chief tn. of Eritrea in N.E. Africa, on Red Sea; pop. 17,160.

Mass Centre. See *Centre of Gravity*.

Maséna [masénah], **André** (1758-

1817). Duke of Rivoli and Prince of Essling, perhaps the greatest of Napoleon's marshals; victorious in It., Poland, Ger.; first serious defeat by Wellington in 1810 in Peninsular War, 6-117.

Massenet [masen'et], **Jules Émile Frédéric** (1842-1912). Fr. composer; his distinctive style appears best in love scenes of his operas; chief works, *Phaïs*, *Le Jongleur de Notre Dame*, *Manon*, ballet music to *Le Cid*, 5-515; *Manon*, 5-518.

Massine, Leonide (b. 1896). Russ. dancer and choreographer. Member of Diaghilev ballet and Ballets Russes de Monte Carlo. Ballets include *Good-humoured Ladies*, *La Boutique Fantaisie*, *The Three-Cornered Hat*, *Choreartium*, 1-352.

Mas'inger, Philip (1581-1640). Eng. dramatist; author of 15 plays and collaborator with Fletcher and others in many more; most of his plays have an obvious moral intention, but his heroes are too good and his villains too wicked to be convincing, 3-119.

Mass-production, in motor industry, 5-283, 280, 281 illus.

Mass Radiography. The radiographing of large numbers of persons or objects one after the other by means of an automatic X-ray machine and camera.

Mass-spectrograph. Instrument invented by F. W. Aston, used in investigations of isotopes by action of "positive rays" in a discharge tube, 4-301.

Mast, in ships, 7-41.

Master. Degree in arts, science, etc. See *Degree*.

Masters, Edgar Lee (1869-1950). American poet, 7-366.

Mastersingers. Ger. art-song-poets, successors of the courtly Minnesingers; organized in guilds 11 16th cent., 4-13; and Nuremberg, 5-176.

Mastersingers of Nuremberg. The Opera by Wagner, 5-519, 518 illus., 7-109.

Mastication, of rubber, 6-165.

Mastiff. A large Brit. dog with a heavy head and broad, hanging ears; smooth-coated; colour buff or fawn, 3-101 with illus., f.

Mastodon. See *Mammoth and Mastodon*.

Mastoid (mastoid process). The bony mass behind the ear; liable to infection and inflammation, 3-118.

Masulipatam or **Bandar**. Spt. of Rep. of India in Andhra state on one of mouths of the Krishna; pop. 59,116; weaving, bleaching, and cloth printing; first settlement of E. India Co. (1611), 4-252.

Masurian Lakes. A sickle-shaped group of lakes in Olshzyn prov. (formerly Masuria), Poland; strategically important in German-Russian battles of both World Wars, 7-479.

Masurium. See *Techetium*.

Matabeleland. Dist. of S. Rhodesia, 6-395; Matabele rising, 6-393.

Matador. Man whose task it is to kill the bull in a bull-fight, 2-122, 121 illus.

Matanzas. Spt. and rly. centre on N. coast of Cuba, 50 m. E. of Havana; pop. 72,820; chief export, sugar.

Matapan, Cape, Battle of. Brit. sea-air victory, Mar. 28, 1841, over It. fleet, off C. Matapan, Greece, 7-490.

Match, in lawn tennis, 4-70.

Matchboxes, collectors of labels, 5-147.

Matches, 5-146; yellow phosphorus in, 6-162; and sulphide of antimony, 1-178.

Matchlock Gun, 3-359, 358 illus.

Mate or Paraguay Tea. Beverage made from dried leaf of *Ilex paraguayensis*, 2-46, 4-187.

Materialists. School of philosophers, 6-160.

Materia Medica (Latin words meaning materials of medicine). That part of the study of medicine which deals with the source, preparation, and use of drugs. Also title of publication of British Medical Association, standard work on the subject, first published 1852.

MAUD

Mathematics, 5-147; employments using mathematics, 2-230; addition, 1-16; arithmetic, 1-237; division, 3-98; factors, 3-333; fractions, 3-428; logarithms, 5-17; Maxwell's work, 5-149; mensuration, 5-170; multiplication, 5-293; numbers, 5-174; series, 6-532; slide rule, 7-47.

Mather, Cotton (1663-1728). Amer. preacher and scholar, leader of conservative New England Puritans and of Salem witchcraft persecution, 7-363.

Matilda (d. 1083). Queen of William I and daughter of Baldwin V, count of Flanders.

Matilda (1080-1118). Queen of Henry I of Eng. and daughter of Malcolm III and St. Margaret of Scot., 4-161.

Matilda (1102-67). Queen of Eng. (crowned 1111), daughter of Henry I of Eng. and wife of Emperor Henry V. As she was in constant conflict for the English throne with her brother Stephen, and was never able to substantiate her claim, Stephen is usually accepted as the rightful successor of Henry I. But Stephen was succeeded by Matilda's son, Henry II.

Matins. One of the canonical hours, 5-241.

Matise [matés'l], **Henri** (1869-1954). Fr. painter, one of the most influential of his time; evolved new colour-harmonies and use of tones; led the "Fauves" group; also a fine lithographer, 3-149.

Matlock. Tn. in Derbyshire, Eng., 17 m. N.W. of Derby, 3-76, 6-118.

Matopo Hills. Range of hills in Matabeleland, S. Rhodesia, where is the grave of Cecil Rhodes, 6-393; native village, 6-394 illus.

Matrimonial Causes Act. Statute relating to divorce, which came into force on Jan. 1, 1938. Its passing largely due to efforts of Sir A. P. Herbert, M.P., the well-known writer. By this Act desertion and incurable insanity became grounds for divorce.

Matrix. In type making, 7-390 with illus.; "linotype," 4-516, 518 illus.; of "Monotype," 5-217 illus.

Matronalia. Rom. festival in honour of Juno, 4-386.

Matsys, Quentin (1466-1530). Flemish painter, 6-31, 5-381.

Matthias. Jewish priest, who with his sons the Maccabees defeated the Syrian army (130 B.C.) and won independence for the Jews, 4-375.

Matter. In physics, 2-455; and energy, 1-299.

Matterhorn (Fr. *Mont Cervin*). Peak in Alps on W. frontier between Switzerland and Italy; 14,782 ft.; first ascended by a party led by Edward Whymper, July 14, 1865, 1-123 illus., 7-211, 1-126.

Matthay, Tobias (1858-1945). Brit. professor of the piano, taught at London Academy for 45 years. Founded "Matthay Method."

Mat'thew, St. (Hebrew "gift of God"). One of the Twelve Apostles, traditional author of First Gospel, 1-184.

Matthias. One of the Apostles (Acts 1), 1-181.

Matthias (1557-1619). Holy Roman Emp. and king of Bohemia, 7-269.

Matthias I, Hunyadi (1440-90). King of Hungary. Also called Matthias Corvius from the raven (*corvus*) on his escutcheon; son of János Hunyadi; elected king 1458, repeatedly defeated Emperor Frederick III, Turks, and Poles, and became most powerful ruler in central Europe; equally capable as soldier, administrator, orator, law-maker, 4-206.

Mattiot, Count, supposed Man in the Iron Mask, 4-296.

Matzo. Loaves of unleavened bread; eaten by Jews at Passover, 6-94.

Maubeuge [môbêzh]. Fr. tn. near Belg. border, 50 m. S.E. of Lille; pop. 20,859; taken by Germans 1914 and 1940.

Maud (1869-1938). Queen of Haakon VII of Norway, youngest daughter of Edward VII of Gt. Brit., 1-101 illus.

MAUDE

Maude, Cyril (1862-1951). Brit. actor and theatrical manager; finished performer of many quietly humorous parts ("Grumpy," etc.).

Maudslayi, Henry (1777-1831). Brit. engineer. Inventor and manufacturer of machine-tools; built first screw-cutting machine.

Maufo, Sir Edward (b. 1883). Brit. architect (R.A., 1947). Known especially as an architect for modern churches, he was the architect for Guildford Cathedral; designed B.B.C. studio for religious broadcasts; also R.A.F. memorial, Runnymede; reconstruction of Gray's Inn and Middle Temple, London.

Maughan (mawm) Frederick Herbert, 1st Baron (b. 1866). Brit. lawyer. Judge of High Court of Justice (Chancery Div.) during 1928-34; Lord Justice of Appeal, 1934-35; Lord High Chancellor 1938-39, brother of W. Somerset Maughan.

Maughan, William Somerset (b. 1874). Brit. novelist, dramatist, and short-story writer; C.E. 1954; novels incl. *Of Human Bondage*, *Cakes and Ale*, *The Painted Veil*; plays, *The Circle*, *Our Betters*, *Shelley*, 3-291; portrait, 3-280 illus.

Maul. One of Hawaiian Is.; 728 sq. m., pop. 40,108, 4-139.

Mau Mau. Frigitive secret society of the Kikuyu people, Kenya; activities, 4-400.

Mauna Kea [mow'na kēa] (Hawaiian "white mountain"). Extinct volcano on Isl. of Hawaii; highest peak in Pacific Isls., 13,784 ft., 7-405, 4-139.

Mauna Loa ("great mountain"). Active volcano on S. Hawaii Isl.; 13,760 ft.; crater of Kilauea on E. slope, 7-405, 4-139.

Maundy Money, carried by "Beef-eaters," 1-410 illus. f.

Maupassant [mōpāsahāns], Guy de (1850-93). Fr. novelist, master of short story; 3-456; on Normandy, 5-448.

Mauretania. Anc. name for N.W. Africa, comprising modern Morocco and W. Algeria.

Mauretania. Name of two British liners. First, a Cunard liner of 31,938 tons, launched 1906. Hoid Blue Ribband of Atlantic until beaten by *Gor Bremen* in 1929. Broken up in 1935. Second, a Cunard-White Star liner, 35,677 tons, launched 1938. Used as transport ship in 2nd World War. Returned to normal service 1947.

Mauriac [mōr'āk], François (b. 1885). Fr. writer; novels *La Chair et Le Sang*, *Thérèse Desqueroix*; play, *Asmodée* (Eng. trans. *The Intruder*), 3-456.

Mauriaum. Battle of, Attila defeated (451), 1-306.

Maurice (1521-53). Duke, and by conquest his cousin John Frederick, elector of Saxony; one of foremost generals and most cunning diplomats of his day, extorted from Emperor Charles V Treaty of Passau (1552), giving Protestant liberty of worship until Diet of Augsburg.

Maurice, John Frederick Denison (1805-72). Brit. clergyman, theologian, and social reformer; founded Working Men's College, leading figure in Christian Socialist movement.

Maurice of Nassau (1567-1625). Prince of Orange (son of William the Silent), Dutch general, one of ablest of his age; led Netherlands in successful resistance to Span. domination until the truce of 1609.

Mauritius. Brit. Isl. in Indian Ocean; area 720 sq. m.; pop. 475,386; cap. Port Louis; 5-146; dodo, 3-100.

Maurois, André (b. 1885). Fr. writer (real name Emile Hertzog); popular in Britain for his shrewd and sympathetic insight into Brit. character, as revealed in his novel *The Silences of Colonel Bramble*; also wrote many brilliant biographies (Shelley, Disraeli, Byron, Dickens, etc.); addressing Fr. academy, 3-456 illus.

Mausoleum, at Halicarnassus, 7-1.

Mausolus [maw'sō'les] (4th cent. B.C.). King of Caria, whose wife Artemisia erected famous "mausoleum" to his memory, 7-1.

Mavia. Name formerly in general use in Eng. for the song-thrush.

Mawddach. R. of Merionethshire, Wales, 22 m. long; flows into sea at Barmouth, 5-178.

Mawson, Sir Douglas (b. 1882). Australian Antarctic explorer; went with Shackleton, 1907, and led expeditions 1911 and 1929; 6-246; and Antarctic wind speeds, 1-164.

Max, Adolphe (1869-1939). Burgomaster of Brussels at beginning of 1st World War for 3 months until imprisoned in Ger.; heroically resisted efforts to break his moral and spiritual opposition to Ger. invaders, 2-101.

Maxentius, Marcus Aurelius Valerius (d. 312), elected Rom. emperor A.D. 306; defeated by Constantine, 2-489.

Maxim, Sir Hiram Stevens (1840-1916). Brit. inventor, b. in U.S.A.; 5-64; inventor of Maxim machine-gun; a pioneer of aeronautics; flying machine, 1-37, 30 illus.

Maxim Gun. Type of machine-gun, 5-64.

Maximilian I (1459-1519), Holy Rom. emperor; succeeded in 1493; called 2nd founder of House of Hapsburg, which, by marriages of himself, son, and grandson, gained Netherlands, Spain, Hungary, and Bohemia, thus creating vast empire of Charles V and his successors; 4-8, 4-129; portrait, 4-129.

Maximilian I, the Great (1573-1651). Elector and Duke of Bavaria, helped form Catholic League which opposed Prot. Union in Thirty Years' War; party to peace of Westphalia in 1648; considered ablest Cath. ruler of his time; his beard, 1-398 illus.

Maximilian I (1756-1825). First king of Bavaria; succeeded as elector in 1799; aided Napoleon and received title of king as a reward.

Maximilian II (1811-64). King of Bavaria. Monarch of liberal tendencies; succeeded to throne on abdication of his father (1848); opposed exclusion of Austria from Ger. confederation; father of the mad kings Ludwig II and Otto.

Maximilian I (1832-67). Archduke of Austria and emperor of Mexico, 5-189.

Maxwell, James Clerk (1831-79). Scot. physicist, 5-149; work on electromagnetic waves, 3-301, 3-221, 6-341.

Maxwell. The C.G.S. unit of electromagnetic flux, equal to one line of force (g.v.). Called after James Clerk Maxwell.

May, Phil (1864-1903). Brit. black-and-white artist, famous for his skill in using the fewest possible lines; chiefly depicted "low life" in London.

May, Sir Thomas Erskine (1815-86). Brit. civil servant; authority on Parliamentary procedure, 6-91.

May. Fifth month of the year; festivals, 5-255.

May. Hawthorn blossom, 4-142.

Mayas. An Amerindian people inhabiting peninsula of Yucatan at time of Span. conquest; developed a remarkable civilization, 1-334; archaeological work on, 1-206; calendar, 1-332.

May Day, 5-255; Odin and May festivities, 5-500.

Mayfair. Fashionable West End quarter of London, situated N. of Piccadilly; gives its name to the more fashionable and gayer aspect of "Society" life.

Mayflower. Ship which carried Pilgrim Fathers to New England, 6-200.

Mayfly, 5-150; metamorphosis of, 4-268.

Mayo. Co. of Irish Rep. in Connaught prov.; area 2,084 sq. m.; pop. 141,696. Atlantic coastline provides wild, magnificent scenery. Level in E., mountainous in W. Cattle, sheep, and pigs reared; oats and potatoes grown.

MEAT

Mayonnaise. A salad dressing; origin of name, 1-349.

Mayor. Official head of cities and boroughs in the United Kingdom, and chief executive of municipalities in U.S.A., and other countries; elected annually, he acts as chief magistrate in London and several other cities of Gr. Brit. and the Commonwealth; he is known as the Lord Mayor; the Scot. equivalent is Provost or Lord Provost.

Mayor of the Palace (major domus). Official in Frankish kingdom under Merovingian rule.

Mayow, John (1640-79). Eng. doctor and chemist; oxygen experiment, 1-81 with illus.

Maypole. Tall pole formerly set up on village greens as centre of May Day festivities (some poles were fixtures). It was garlanded with flowers and ribbons, attached to the top, which were held by dancers. Custom abolished by the Commonwealth, but Maypole dances have been revived by folk-dance enthusiasts. Probably the Maypole and its rites are a survival of primitive tree worship.

May Week, at Cambridge Univ., 6-459.

Mazarin, Jules (1602-61). Fr. cardinal and statesman, 5-150, 5-42; and Thirty Years' War, 7-270.

Mazarine Bible. First complete book printed from movable type, 6-289 with illus., 1-443.

Mazarine Blue Butterfly (now extinct), 2-141 illus.

Mazatlan. Spt. on W. coast of Mexico, pop. 64,000; 5-186.

Maze, at Hampton Court, 4-124.

Mazepa [mazep'a], Ivan (1644-1709). Cossack chief, powerful in Rus. under Peter the Great; deserted to Charles XII of Sweden, 2-314.

Mazzard (cherry tree). See *Gean*.

Mazzini, Giuseppe (1805-72). Italian revolutionary leader, 5-161, 4-316 as a writer, 4-330.

Mbabane. Cap. of Swaziland, S. Africa, 7-89.

Mbangi. See *Ubangi*.

M.C.C. See *Marylebone Cricket Club*.

Mead. Alcoholic drink made from fermented honey and water, some times strengthened by addition of brandy. Once common drink in Eng.

Meadow Brown Butterfly, 2-139 illus.

Meadow Crane's Bill. Plant, 3-521, 2-24 illus. f.

Meadow Foxtail, grass, 4-frontis.

Meadow Mushroom, 3-488 illus. f.

Meadow-pipit. Bird, 6-205.

Meadow Saffron. Plant, 2-533.

Meadow-sweet. A species of *Spiraea* native to England, in moist places; small, creamy, fragrant flowers.

Meales. Name given to maize in Africa, 5-90.

Meals, 5-151; medieval banquet, 5-199 illus.

Meander or Maeander. R. of Asia Minor (now called Menderes) famous for its many windings—hence the verb "to meander"; 240 m. to its mouth at Miletus.

Mean Solar Time, 7-277.

Means Test. Name given to bill, passed in 1932, full title of which was the Transitional Payments (Determination of Need) Bill. After drawing benefit for 26 weeks, an unemployed man had to satisfy Public Assistance Committees of his lack of means before he could receive any further relief. Abolished 1947.

Mears, Somerset, Eng.; remains of lake-village, 4-440 illus.

Mearns, John (c. 1756-1809). Brit. navigator; explored coast of Alaska sailed to China via Hawaiian Is.

Mearns, The. See *Kingsdownshire*.

Mease, r. of midland Eng., tributary of the Trent, 31 m. long, 4-476.

Measure. See *Musical Terms* (list).

Measures. See *Weights and Measures*.

Meat, 5-153; Argentine trade, 1-223.

Meat, 2-496; food value of, 2-409-10; in medieval diet, 1-77; pig, 6-197; protein in, 6-297; salt-meat, 2-312; sun-drying, 7-99 illus.

Meat, 7-404.

MEATH

Meath. Co. of Irish Rep., in Leinster prov.; area 965 sq. m.; pop. 66,343; cattle and pigs reared; oats and potatoes grown.

Meaux [mô]. Fr. tn. on r. Marne 30 m. E. of Paris; pop. 14,230; farming- and milling centre.

Mecca. Holy city of Mahomedans in Saudi Arabia near Red Sea; pop. about 200,000; 5-186; Mahomet's flight from, 5-88; Burton's journey to, 2-133; prayer towards Mecca, 4-425.

Mechanical Shovel. type of excavator; how it works; 3-325 with illus.

Mechanics. Branch of physics dealing with force and motion, 5-166; pulley, 6-302.

Mecklin. Alternative name for Belgian town of Malines.

Mecklin Laos. 4-431 illus.

Mecklenburg. Until 1945 fifth largest state in Germany, brought about by the union of Mecklenburg-Schwerin and Mecklenburg-Strelitz in 1934; each was formerly a grand duchy; since 1946 part of the Soviet-occupied zone of E. Germany.

Mecklenburg-Schwerin, Henry, Duke of (1876-1934). Husband of Queen Wilhelmina of the Netherlands.

Mecoptera. Order of insects containing the scorpion-fly, 4-270.

Médaille Militaire. Highest Fr. decoration for gallantry, 6-530.

Medea. In Gk. myth., a famous enchantress, daughter of King of Colchis, 5-159; and Jason, 1-226.

Medellin. Second city of Colombia, S. Amer.; gold and silver mining and mfg. centre, 150 m. N.W. of Bogotá; pop. 198,100; univ., school of mines.

Medes. Anc. Indo-European people of the Caspian region, closely akin to the Persians, 5-159; fall of Nineveh, 1-338, 5-442; empire in Persia, 6-129; costume, 2-420.

Mediā. Anc. kingdom and country now contained in N.W. Persia; home of Medes.

Medici [med'ichē]. Famous Florentine family, 5-160, 6-381. For individual members see below.

Medici, Catherine de' (1519-89). Wife of Henry II of Fr., 5-160 with portrait; and reign of Charles IX, 2-309.

Medici, Cosimo de' (1389-1464). Florentine banker, politician and art patron, 5-160, 3-393.

Medici, Giovanni de' (1360-1429). Founder of the powerful Medici family, 5-160.

Medici, Lorenzo de' (1449-92). "The Magnificent," ruler of Florence and patron of art, 5-160, 3-393; and Botticelli, 2-26; and lt. language, 4-329; and Michelangelo, 5-190.

Medici, Marie de' (1573-1642). Queen of Henry IV of Fr., 5-160; and Richelieu, 6-400.

Medicine. 5-161; anaesthesia, 1-142; antibiotics, 1-174; antiseptics and asepsis, 1-176; Arab contribution, 5-161; career as doctor, 2-238; career as health visitor, 2-236; careers in radiography, 2-240; drugs, 3-127; in anc. Egypt, 3-196; first aid, 3-365; germs in disease, 4-14; infra-red rays in treatment of rheumatism, 4-261; Lister and antiseptic surgery, 4-522; nursing, 5-485; oxygen tent, 6-23 illus.; and use of photography, 6-169; physiology, 6-189; physiotherapy, 6-192; radium used in treatment of cancer, 6-352; Red Indian medicine men, 6-374; X-rays, 7-507; vaccination, 7-374. See also Surgery.

Medicine Hat, Alberta. Industrial and agricultural centre in S.W. on S. Saskatchewan r.; pop. 16,364; natural gas, 1-93.

Medina [mād'na]. Holy city in cent. Arabia, 110 m. E. of Red Sea; much visited by Mahomedan pilgrims; pop. 20,000; 1-191; Mahomet's tomb, 5-88.

Medina Sidonia, Alonso Perez de Gusman, 7th Duke of (1550-1615). Span. admiral, commander of Sp. Armada, 1-240, 241.

Mediterranean Sea. 5-166; map f. 7-333; compared with Adriatic Sea, 1-20; coral, 2-504; ports and rivers, 3-308.

Mediterranean Climate. forests in, 3-421.

Medium. In spiritualism, a person who is utilised in communicating with the "spirit" consulted.

Medium Waves. in radio, 6-341, 345.

Medlar. Fruit tree of the apple family, 6-324.

Médoc. Dist. of Fr. w. of Gironde estuary. Grape-growing region famous for red Bordeaux wines.

Medulla Oblongata. Lowest part of the brain, merging into the spinal cord; its work, 2-40 with illus.

Medullary Rays. Bands of tissue separating the vascular bundles of plant stems; they give much of the "figure" to woods.

Medusa. In Gk. myth., one of the three Gorgons; killed by Perseus, 6-128; and Pegasus, 6-106.

Medusa (zool.). An adult free-swimming jelly-fish, 4-360.

Medway. Navigable r. in S.E. Eng., joining Thames at Sheerness, near mouth; length, with estuary, 72 m.; on its banks are Tonbridge, Maidstone, Rochester, Chatham; 4-398.

Mee, Arthur (1875-1913). Brit. editor and writer. Founder-editor of *Children's Newspaper*. *Children's Encyclopedia*, etc. Ed. *The Children's Bible*. *The Children's Shakespeare*. *The King's England*.

Meerschaum. A clay-like mineral used chiefly for tobacco pipes; found in Morocco, Asia Minor and France.

Meerut. Tn. in Uttar Pradesh, India, 35 m. N.W. of Delhi; pop. 169,290; cotton trade centre; here Indian mutiny first broke out (1857), 2-453.

Mega or Meg (M). Prefix signifying one million times, chiefly used in electrical work, e.g., megavolt, one million volts; megawatt, one million watts.

Megalopolis [megulop'olis]. Anc. Gk. walled city in Peloponnesus; founded by Epaminondas (370 B.C.) as cap. of Arcadian confederacy; sacked by Spartans (222 B.C.).

Megara [mog'ra]. In Gk. myth., one of the Furies.

Megalosaurus. prehistoric animal, 6-281.

Megapodidae. Family of birds found in Australia that do not incubate their eggs, 3-172.

Megara. In Gk. myth., wife of Hercules, 4-165.

Mégo-Mouries, Hippolyte (19th cent.). Fr. chemist, inventor of margarine, 5-124.

Mehadia. Tn. in N.W. Rumania, famous for Horculus baths.

Mehemet Ali [mā'heinet ah'lē] (1769-1849). Viceroys of Egypt; massacred Mamelukes (1811); conquered Syria but compelled by European powers to give it up in 1841; did much to develop Egypt, 3-176; mosque, 2-164 with illus.

Melike [mē'kē], Andrew (1719-1811). Brit. inventor; invented the first really successful threshing machine.

Meln Kampf. Book by Adolf Hitler giving principles of National Socialism, 4-10.

Melissen [mē'sen]. G. tn. in Saxony on Elbe 15 m. N.W. of Dresden; pop. 45,000; 13th cent. cath.; Dresden china, 6-277, 276 illus. f., 4-4.

Melissonier [mā'sōnyā], Jean Louis Ernest (1815-91). Fr. military and genre painter; Napoleon's retreat from Moscow, 5-321 illus.

Mekong [mā'kong], r. in S.E. Asia; rises in Tibet; flows 2,600 m. into China Sea; forms greater part of boundary between Siam and Indo-China; 4-446, 4-257.

Melanchthon [melank'thon], Philip (1497-1560). Ger. religious reformer, friend and ally of Luther; the peacemaker and scribe of the Protestant Reformation, 6-378.

Melanesia. Division of Pacific Isla., 6-26.

MEMORIAL HALL

Melanesians. People of the Melanesia division of Pacific Isla.; racial characteristics, 6-26, 5-396.

Melanin. Pigment (black), in colouring of horses, 4-197.

Melanism. An excess of pigment in the skin, hair, and tissues, producing real or comparative blackness; opposite of, and less frequent than, albinism.

Melba, Nellie (Nellie Potter Mitchell) (1859-1931). Australian prima donna; coloratura soprano; created D.B.E. in 1918; 6-316, 1-321.

Melbourne, William Lamb, 2nd Viscount (1779-1848). Brit. statesman; entered Parl. 1806; succeeded to peerage 1829; home secretary 1830; premier (1831, 1835-41); mentor of young Queen Victoria, 7-396.

Melbourne. Cap. of Victoria, Australia; called after Lord Melbourne; pop. 1,326,000; 5-167.

Melchisedek [melkiz'edek]. Priest-king (Gen. xiv, 18); taken as typifying Christ (Heb. vii, 1-21).

Mélie, Georges. Early Fr. film producer, 2-395.

Melilla [mā'li'ya]. Sp. fortified port and penal settlement on N. coast of Morocco; scene of Spanish defeat by native tribesmen (1921); pop. 60,500.

Mellon, Andrew William (1852-1937). Amer. financier; sec. of treasury (1921-32); U.S. ambassador to Brit. (1932-33); art collection, 2-451.

Melody. See Musical Terms (list).

Melon. Fruit of the Cucurbitaceae family, 5-167.

Melos [mē'los] or Milo. Mountainous Gk. Isl. 75 m. E. of Greece; 52 sq. m.; exports sulphur, manganese; Venus of Milo statue found here in 1820.

Melpomene [melpom'enē]. In Gk. myth., Muse of tragedy, 5-299.

Melrose. "An. in Roxburghshire, Scot., 6-160.

Melrose Abbey, Scot. Magnificent ruin in tn. of Melrose, Roxburghshire.

Melting Point. of metals, 5-177.

Melton Mowbray [mē'ton] Tn. in Leics. Eng. 102 m. S.W. of London, in famous hunting dist.; noted for pork pies; pop. 11,052; 4-176.

Melun [mē'lē]. Fr. mfg. and rly. centre on Isl. and on both banks of r. Seine, 28 m. S.E. of Paris; it manufactures leather, pottery, etc.; pop. 17,570.

Melville, Herman (1819-91). Amer. author (*Typee* and *Momo*), earliest and among the best tales of the South Seas; *Moby Dick*, or the White Whale; *White Jacket* (collected edition of flogging in U.S. Navy); 7-361.

Melville Island. Uninhabited Canadian Isl. of Arctic regions N. of Victoria Isl.; 26,000 sq. m.

Melville Island, Australia. Off centre of N. coast; 1,800 sq. m.; densely wooded, cap with eucalyptus trees.

Melville Peninsula, Canada. 400 m. N. of Hudson Bay, between Gulf of Boothia and Fox Channel; 25,000 sq. m.

Membranous Labyrinth. In anatomy of ear, 3-114.

Memel [mā'mel] (Klaipėda), Lithuania, S.S.R. Baltic fortified port 60 m. S. of Libau; pop. 30,000; old House tn.; taken from Ger. by Peace Conference (1919); annexed by Germany in 1939, 3-318, 7-485.

Memling or Memline, Hans (c. 1430-94). Flemish painter of portraits and religious subjects, 5-381, 382 illus.

Menni, Lippo (d. 1357). It. painter of Sienese school; worked with Simone Martini; 4-317.

Mennon. In Gk. myth., son of Tithonus and Eos. Statues nr. Thebes, Egypt, once thought to represent him, 2-462 illus., 3-173, 3-197.

Memorial Hall, Farringdon St., London. occupying part of the site of the old Fleet Prison; built by Congregationalists to commemorate the 2,000 clergy who were ejected from their livings as a result of the Act of Uniformity of 1662.

MEMORY

Memory, 5-167; and the brain, 2-41; "memory units" in calculating machines, 2-171, 172 illus.

Memphis [mem'fis]. Early cap. of Lower Egypt at apex of Nile delta s. of Cairo, now in ruins; huge statues of Ramesses II; 2-161, 3-184.

Memphis, Tennessee, U.S.A., largest city of state; pop. 391,012; trade in cotton, lumber, horses, mfrs., 7-256.

Menagerie. See **Zoological Gardens**.

Ménail [men'ail] Strait. Narrow channel separating isle of Andksey from Wales; spanned by Telford's suspension bridge and the Britannia tubular bridge, 1-150, 2-67, 7-155, 7-413 illus.

Menam River. Chief river of Siam, flowing s. from Burma 750 m. and entering Gulf of Siam, 7-47 illus.

Menander (342-291 B.C.), Gk. dramatist, the inventor of "New Comedy" as it is now styled, as opposed to "Old Comedy" of Aristophanes; 3-116.

Mencius [men'chiūs] or **Meng-tse** (c. 372-289 B.C.). Chinese sage, placed second only to Confucius.

Mencken, Henry Louis (1880-1956). Amer. critic, 7-366.

Mendana Islands. See **Marquessa Is.**

Mendel, Gregor Johann (1822-84). Austrian priest and biologist; established Mendelian laws of heredity, 5-168, 4-168.

Mendeleev, Dmitri Ivanovitch (1834-1907). Russ. chemist; formulated Periodic Table of the elements, 5-169, 3-225.

Mendelssohn, Erich (1887-1953). Ger.-Jewish architect; Einstein Tower, Potsdam, De La Warr pavilion, Bexhill, Sussex, 1-218.

Mendelssohn, Jakob Ludwig Felix (1809-47). Ger. musician and composer, 5-169, 4-373; "The Hebrides" overture, 7-140; music for *A Midsummer Night's Dream*, 5-201.

Mendes [mandes'], **Catulle** (1811-1909). Fr. poet and novelist. *Le Roi Vierge*, novel; *Sainte Thérèse*, play.

Mendes-France, Pierre (b. 1907). Fr. economist and politician. Prime min. and min. of Foreign Affairs from June, 1954, to Feb., 1955.

Mendip Hills. Range 6 m. broad and 20 m. long in W. Somerset (1,068 ft.); stalactite caves; Rom. remains; 2-88, 3-247, 218, 7-81.

Mendoza, Pedro de (c. 1487-1537). Span. captain, colonizer of Plata r. region in Argentina, 1-225, 2-108.

Mendoza, Argentina. Cap. of prov. of Mendoza, at foot of the Andes, 650 m. N. of Buenos Aires; chief centre for trade with Chile; pop. 103,800.

Menelaus [menel'aus]. In Gk. myth., king of Sparta, brother of Agamemnon and husband of Helen; 4-189, 7-320.

Menelek. Son of Queen of Sheba and Solomon; traditional first king of Abyssinia, 1-8.

Menelek II (1844-1913). Emperor of Abyssinia, elected 1889; able and enlightened ruler; forced recognition of Abyssinian independence from European powers, 1-7.

Menes (mē'nēz). First of the historical kings of Egypt; united Upper and Lower Egypt.

Meng-tse. See **Mencius**.

Menhir. Prehistoric unbewn pillar-stone with base sunk in the earth, 7-162 illus.

Menin Gate. On Menin Road, Ypres, Belgium. Scene of heavy fighting in 1st World War; gate now rebuilt as memorial to 54,896 Brit. troops missing in Ypres sector; unveiled 1927.

Menin Road, in the Ypres salient, in 1st World War, 7-482 illus.

Meninges, linings between bone of skull and brain, 2-40.

Meningitis. Disease caused by inflammation of membranes surrounding the brain or spinal cord.

Menkaura. King of Egypt, son of Khufu; sculpture of, 3-184 illus.; pyramid of, 6-312.

Menonites. Protestant sect growing out of Anabaptist movement in 16th cent.; opposed to oath-taking, mili-

tary service, and theological learning; hold to simplicity of life and worship, and often live in separate communities; named from Menno Simons (1492-1559), leader in Netherlands.

Men of Kent. Natives of Kent born on right bank of r. Medway. See **Kentish Men**.

Mensheviks. Russian socialists of more moderate views than Bolsheviks, 6-476, 4-178.

Mensuration. Process of measuring or taking dimensions, 5-170.

"Mental Age", as defined by intelligence tests, 4-271.

Men-thol, a waxy, cooling substance used locally to relieve irritation or pain; distilled from peppermint oil.

Mentone (Fr. Menton). Tn. and tourist resort of Fr. on coast of the Riviera, 14 m. N.E. of Nice. Noted for orange and lemon groves. Olive oil and perfumes exported. Sold to Fr. by Prince of Monaco, 1861; 6-403.

Men'tor. In Gr. myth., friend of Odysseus, guardian of his son, Telemachus; hence wise counsellor.

Ménuhin, Yehudi (b. 1916). Amer. violinist. Debüt at San Francisco aged 7. London début in 1929.

Menzel [men'tsel], **Adolph** (1815-1905). Ger. artist; by his engraving on wood, established himself as one of the first illustrators of his day.

Menzies [men'zēz], **Robert G.** (b. 1891). Australian statesman; Commonwealth attorney-gen. 1935-39; prime min. 1939-41, and again in 1949; Created C.I.I. in 1951.

Mepacrine. Alternative name for mephrin, a substitute for quinine, used in relief of malaria, 5-93, 6-325.

Mephistopheles. In Ger. legend, the familiar spirit attendant upon Faust. Not Satan, as popularly supposed, but a subordinate demon.

Merano. It. cap. of Tirol in 12th-15th cents.; health resort; pop. 19,000; 7-280 illus.

Mercaantilists, in economics, 3-160.

Mercaara. Cap. of Coorg state, Rep. of India, 4-211.

Mercaat Cross at Edinburgh, 3-161 illus.

Mercaator [mēr'kat'ar], **Gerard** (1512-91). Flemish geographer and map-maker; originated "Mercator's projection" of the globe, 5-118, 119 illus., 120 illus.

Mercator's Projection. Principle of showing the surface of the globe on a flat surface, 5-118, 119 illus., 120 illus., 8 frontis.

Mercer, John (1791-1866). Brit. chemist; discovered process of mercerising, 5-171.

Mercerising. Process which gives silky finish to cotton, 5-171.

Mercers' Company, a London Livery Company, 4-326.

Merchant Adventurers. Title accorded by royal patent, 1505, to group of Eng. merchants engaged in foreign trade. Concerned chiefly with export of cloth. Company dissolved at end of 18th cent.

Merchant Aircraft Carrier, in Second World War, 5-343.

Merchant Navy, 5-171; cadet training, 2-159; careers in, 2-238; East Indianen, 7-36 illus.; in Greece, 4-80; types of ships used by, 7-32; shipping losses in battle of the Atlantic, 1-293, 295.

Merchant Navy class of locomotives; Golden Arrow, 5-9 illus.

Merchant of Venice, The. Comedy by Shakespeare, 5-173.

Merchant Taylors' School. Public school for boys (since 1933 at Sandy Lodge, nr. Northwood, Middx., with 50 boarders). Founded by Merchant Taylors' Company, 1561, in Suffolk Lane, City of London; moved to site of old Charterhouse School, 1875; 6-503, 4-526.

Mercia. An Anglo-Saxon kingdom of 6th to 9th cents., occupying most of what is now central Eng.; during 8th cent. it was the most powerful of all the kingdoms.

Mercuric Chloride, 6-235 shape of molecule, 2-319 diag.

MERTON

Mercury. In Rom myth., the messenger of the gods, and god of merchandise and merchants; identified with Gk. Hermes, 5-173; Odin identified with, 5-500.

Mercury. Smallest of the principal planets, 6-212, 7-188 illus.; force of gravity on, 4-67; perturbations of, 6-382; in solar system, 1-282, 278 illus.

Mercury (Hg), or **Quicksilver**. A fluid metallic element of the zinc group; atomic no. 80; atomic weight 200.6; melting point, 38° F.; 5-173, 3-224; and acids, 1-12; alchemical theory, 1-95; alloys, 1-116; in barometer, 1-370; cooling and solidifying, 3-165; and surface tension, 7-192, 193; in thermometer, 7-267; vapour pump, 7-373.

Mercury, Fulminate of, as an explosive, 3-329.

Mercury Vapour Lamp, 3-220, 5-174, 4-501; tubes of fused quartz, 6-320; ultra-violet rays produced by, 7-341.

Mer de Glace. Great Alpine glacier to the N. of Mont Blanc, 1-125.

Meredith, George (1828-1909). Brit. poet and novelist; intellectual, mannered writer; poems include "Modern Love" (1862); novel, *The Order of Richard Feveril* (1859), *The Egoist* (1879).

Merganser. Genus of marine ducks, distinguished by extremely narrow beaks, 3-131 illus.; foot, 1-171 illus.

Merida [mā'rida]. Cap. of Yucatan, Mexico, 23 m. s. of its port, Progreso, on Gulf of Mexico; pop. 155,899; sisal hemp industry; 7-317, 5-186.

Meriden. Village in Warwickshire, Eng., about 5 m. from Coventry; reservoir, 7-425 illus.

Meridians, of longitude, 4-152.

Mérimée [mē'ri-mē], **Prosper** (1803-70). Fr. novelist, historian, and critic, great master of style (*Colombi, Carmen; Laites a une inconnue*), 3-156.

Merino. Breed of sheep, 7-22.

Merionethshire. Co. of Wales, area 660 sq. m.; pop. 11,456; co. tn. as Dolgellau; 5-174.

Merlin. Legendary Brit. bard, prophet, and magician of Arthurian times, 1-256; and Vivien, 6-157.

Merlin. Bird of prey, the smallest Brit. falcon, 4-141.

Mermaid. Mythical sea-maidens, half human, half fish, 5-175.

Mermaid. Variety of rambler rose, 6-153 illus. f.

Mermaid Tavern. Inn which once stood in Bread St., near Cheapside, London; Ben Jonson and, 4-352, 5-20.

Merovingian Dynasty. Frankish royal line, ruled, 486 to 752, 3-449.

Merrick. Mt. in Kirkcubrightshire, Scot., 2,761 ft., 4-415.

Merrimac. It. of U.S.A., rising in N.W. and flowing through Mass. to the Atlantic; length 100 m., 5-145, 5-397.

Mer'riman, Henry Seton (1862-1903). Name adopted by Hugh Stowell Scott, Brit. novelist, who wrote many popular novels (*The Slave of the Lamp; The Sowers; Barlath of the Guard*).

Mer'sa Matruh. Coast tn. of Egypt, 100 m. W. of Alexandria; strong-point in defence of Egypt in N. Africa campaign of 2nd World War; 7-492.

Mer'sen, Treaty of. Charles the Bald of Fr. and Louis of Ger. divided Lotharingia, the territory left by their nephew Lothar I (870).

Mersey. R. in N.W. England; flows 70 m. W. to Irish Sea; Birkenhead on, 1-472; Liverpool on, 4-521; radar image of, 6-338 illus.; tunnel under, 7-327, 328 illus.

Merseyside. Name given to Liverpool Birkenhead, Wallasey, and neighbouring boro., 4-525.

Mersey Tunnel, Liverpool, 7-327, 328 illus., 4-526.

Merthyr Tydfil. Tn. in S. Wales on 1 Taff; pop. 61,093; 7-410.

Merton. Tn. in Surrey, on r. Wandie

MERTON COLLEGE

8 m. s.w. of London; pop. (Merton and Morden), 74,002.
Merton College, Oxford Univ., 6-17.
Merv, Oasis and anc. city of Turkmen S.S.R., 120 m. N. of Afghanistan frontier, 1-266.
Méryon (mā'ryōn), Charles (1821-68), Fr. artist; among the greatest of etchers, he produced superb plates of Paris streets; led a most tragic life and died in an asylum; 3-300.
Mesa'bi Range, Minnesota, U.S.A., famous iron-mining region; 4-288 illus.
Mesas, Flat-topped hills; in New Mexico, U.S.A., 5-400.
Mesa Verde (vēr'dā), (Sp. "green table"), National park in s.w. Colorado, U.S.A.; 77 sq. m.; contains ruins of prehistoric cliff dwellings.
Mescal, Mexican drink, made from agave, 1-08.
Mesdag (mes'dakh), Hendrik Willem (1831-1915), Dutch marine painter, noted for studies of North Sea.
Mesheh (mesheh) ("place of martyrdom"), Persia, cap. of prov. of Khorasan in N.E.; pop. 191,000; fine silks, carpets, sword-blades; shrine of Imam Riza, famous Shiite leader of 9th cent.; visited by many pilgrims; 6-134.
Mesmer, Friedrich Anton (1733-1815), Austrian physician and charlatan, author of theory of "animal magnetism" or "mesmerism," also called hypnosis.
Mesolithic Age or Middle Stone Age, 7-163; implements, 5-106; early settlements, 5-109.
Mesons, Particles forming cosmic rays, 6-340.
Mesophyll Cells, in leaf, 6-182 with diag.
Mesopotamia (between the rivers), Old name for Iraq. Fertile plain between the Tigris and Euphrates rivers, 5-175, 4-278; anc. civilization, 1-268; under foreign rulers, 1-339.
Mesozoic Age, in geology, 3-515, 516; prehistoric animals, 6-281.
Messenger (mesahzhā), André Charles Prosper (1853-1929), Fr. composer; studied under Saint-Saëns; light operas include *L'opéra comique* and *Fortunio*.
Messalina (mesalēna), Valeria (d. A.D. 48), Profligate 3rd wife of Rom. emperor Claudius.
Messerschmitt, Wilhelm (b. 1898), Ger. aircraft designer of series of fighter planes (Me 109) and fighter-bombers (Me 110, 210, etc.); 1-35 illus., 2-78.
Messiah, An Anointed One, an expected Saviour or Deliverer; the Israelites looked forward to the coming of such a one, to deliver them as a divine agent, and Jesus was looked upon by the Christian Jews as the fulfilment of their many hopes, 4-363.
Messiah, oratorio by Handel, 4-126.
Messier 81, nebula in Ursa Minor, 1-284 illus.
Messina, Tn. in Sicily at foot of Mt. Etna; pop. 220,795; industries, 7-19; earthquake (1908), 3-153.
Messina, Strait of, between Sicily and Italy; 5-224.
Messina, Antonello da (c. 1430-79), It. painter; brought method of oil painting from Flanders, 4-318.
Mestizos, S. Amer. people of mixed Span. or Port. and Indian blood; in Bolivia, 1-510; in Ecuador, 3-161; boy, 2-317 illus.
Mestrovich (mes'trōvich), Ivan (b. 1883), Yugoslavian sculptor of international fame; work marked by boldness of execution and forcefulness of design, 6-520 illus.
Meta, R. of Columbia, S. Amer., 650 m. long, chief tributary of the Orinoco.
Metabolism, Term for all the chemical changes which occur in living tissue, including anabolism, or building up of tissues, and catabolism, the breaking down of tissues into simpler substances.
Metacarpals, five bones in palm of hand, 4-125.

Metals, Age of, Period of human progress following the Stone Ages, 5-109.
Metallic Paints, types of, 6-38.
Metallurgy, The science of the study of metals, 5-176; alloys, 1-114; careers in, 2-238.
Metals, 5-177; and acids, 1-12, in alchemy, 1-95; alloys, 1-114; as catalysts, 2-322; cutting by oxy-acetylene, 1-10; behaviour of electrons in, 1-298; electroplating, 3-223; as super-conductors at low temperatures, 3-465; ultrasonic welding, 7-344; welding, 7-136.
Metals, in heraldry, 4-161 illus. 1.
Metal-working, in anc. Egypt, 3-184.
Metamorphic Rocks, 6-124, 3-515; slate, 7-65.
Metamorphosis (Gk. "change of form"), In zoology, transformation of structure during growth; 4-268; butterfly and moth caterpillars, 2-263.
Metaphor, Figure of speech, 3-351.
Metaphysics, in philosophy, 6-159.
Metastasio, Pietro Bonaventura Trappasi (1698-1782), It. poet and dramatist, court poet at Vienna for 50 years; composer of many lyric dramas, 4-330.
Metaurus, Small It. in cent. It. emptying into Adriatic Sea; scene of defeat and death of Hasdrubal in 207 B.C.
Metaxas, Ioannis (1871-1941), Gk. soldier and dictator; in 1936 set up totalitarian régime in Greece; when It. attacked Greece, Oct. 1940, won first Allied victory against Axis, 4-78, 79.
Metazoa, Animal group including all many-celled types, 1-151, 2-286.
Metcalf, John (1717-1810), Brit. road-maker and bridge-builder, 6-105.
Metcalf, Percy (b. 1893), Brit. designer of Irish coinage, 4-285 illus.
Metchnikov (metchnikof), Elie (1815-1916), Rus. bacteriologist, naturalised in Fr.; originated theory of phagocytosis, that inflammation is due to struggle between white corpuscles and disease germs; held that a diet of sour milk would lengthen human life; Nobel prize for medicine 1908.
Meteorites, Fragments of meteors which come to earth, 5-181, 1-284; as source of pure iron, 4-288; crater, 5-182 illus.
Meteorological Stations, 7-133.
Meteorology, Science of weather and climate, 5-178; use of balloons, 1-354, 355; hygrometer, 4-225. *See also* Climate; Weather.
Meteors and Meteorites, 5-181, 1-284, 7-189.
Meters, For measuring gas, electricity, and water, 5-182.
Methane, Chemical name for natural gas, 5-331; formula, 2-319; model of organic molecule, 2-320 illus.
Meth'odism, Branch of the Christian Church with a world membership of nearly 12,000,000, 3-161; founded by John Wesley, 7-410.
Meth'odius (d. 885), "Apostle of the Slavs"; brother and co-labourer with St. Cyril.
Methuen Treaty (1703), Commercial-political pact between Portugal and Great Britain, 6-269.
Methuselah (methō'sēla), Son of Enoch and father of Lamech; Gen. v. 27, assigns him a lifetime of 969 years.
Methyl Alcohol, w. alcohol; industrial uses, 1-96.
Methylated Spirit, 7-137.
Methyl Chloride, gas; in refrigeration, 6-378.
Métis, Fr. half-breeds in Canada; Red River Rebellion (1870), 5-115.
Metopos, *See Architectural Terms*.
Metre, A unit of length (1.093 yd.) in the metric system, 5-184.
Metre (music), *See Musical Terms* (dist.).
Metre, in poetry, 6-233.
Metre-Kilogram-Second (M.K.S.) Units, System of physical units based on the length of the metre, the mass of the kilogram, and the time of the second.
Metric System of weights and measures, 5-184.

MICHAELMAS

Metric Ton, Unit of weight in metric system (2,204 lb.).
Metronome, Instrument for marking time in music; pendulum in, 6-115.
Metropolitan Museum of Art, New York, 5-415, 5-301.
Metropolitan Police, London, 6-248.
Metropolitan Water Board, 7-263.
Meiss, Gabriel (c. 1630-67), Dutch painter, 5-384.
Metternich, Clemens, Prince (1773-1859), Austrian reactionary statesman and diplomat; influence over Congress of Vienna (1814-15) secured preponderance of Austria in European affairs; period 1815-18 "Age of Metternich"; 1-326, 4-311; Holy Alliance, 3-315.
Mettur-Cauvery Dam, Madras state, 1-Rep. of India, 5-69, 1-269 illus.
Meitz, Capital of the Moselle dept. of Fr.; pop. 70,105; 5-185.
Meunier (mēnyā), Constantin (1831-1905), Belg. sculptor and painter.
Meuse, R. of w. Europe, 375 m. long; in Netherlands called Maas, 5-185.
Mewar, *See* Udaipur.
Mexican Bean, as part of Mexican diet, 5-188.
Mexican Grass, A fibre obtained from several species of Mex. agaves.
Mexican Swordtail, species of tropical aquarium fish, 4-188, 189 illus. 1.
Mexico, A republic of N. Amer., s. of U.S.A.; area 700,375 sq. m.; pop. 25,581,250; 5-186; map, 5-186; flag, 3-385 illus. 1.; industries, 5-186; Aztecs and other anc. peoples, 1-331; conquered by Cortés, 2-513, 1-134 and California, 2-178; in 1st World War, 7-187.
Mexico, State in s. cent. Mexico; 8,267 sq. m.; pop. 1,383,640; cap. Toluca.
Mexico, Gulf of, Arm of the Atlantic Ocean, almost enclosed by the U.S.A., Mexico, and Cuba; a. 715,000 sq. m.; map, 5-186; Gulf Stream, 4-105.
Mexico City, Cap. of Republic of Mexico; pop. 2,113,451; 5-189.
Mexitli, Aztec name for Mexico City.
Meyerbeer (mē'erbē), Jakob (1791-1861), Ger. opera composer (*The Huguenots*, *Dinorah*); 5-314.
Meynell (mē'nēl), Alice (1850-1922), Brit. poet and essayist; warmly appreciated by a limited public for the delicacy of her work (*The Rhythm of Life*).
Meynell Hunt, English fox hunt in Derbyshire and Staffordshire. Founded 1816. Named after its first master, Hugo Meynell, 3-428.
Mezzanine (mets'anēn), In architecture, low window in an attic, or a storey (e.g., in a theatre) between an upper and lower one.
Mezzo, *See Musical Terms* (dist.).
Mezzo-soprano, in singing, 7-37.
Mez'zotint, Method of engraving, particularly used in 18th cent., 3-293.
MG7, Aluminium-based light alloy, 1-115.
Mho, Name sometimes used for the practical unit of electrical conductance. It is the conductance of a body having a resistance of one ohm.
Miami, Holiday resort in Florida, U.S.A.; pop. 219,276; 3-393.
Mica, A mineral, 5-189, 4-60.
Mica (mī'ka) (about 757-700 B.C.). One of Hebrew minor prophets, contemporary of Isaiah; author of 33rd book of Old Testament.
Mica Schist, A metamorphic rock composed chiefly of mica and quartz; divides readily into slabs.
Michael, An archangel; in Milton's *Paradise Lost*, 5-213.
Michael (b. 1921), ex-King of Rumania, proclaimed king 1927, left throne on accession of his father, Carol II, in 1930. Became king again on Carol's abdication in 1940. Abdicated Dec. 30, 1947. In 1948 deprived, with other members of royal family, of Rumanian nationality, and property confiscated. Married Princess Anne of Bourbon-Parma, 1918; 6-470.
Michael, Tsar of Russia (1613-45), 6-171.
Michaelmas (mīk'hmas), The feast of St. Michael, Sept. 29; goose custom, 4-135.

MICHAELMAS DAISY

Michaelmas Daisy. See *Aster*.
Michael Obrenovich III (1823-88). Prince of Serbia; succeeded 1840, deposed 1842, restored 1860; secured withdrawal of Turkish troops from Serbia; assassinated by Kara-Georgievitch supporters.
Michelangelo (1475-1564). It. sculptor, painter, architect, and poet. 5-190, 4-320, 6-519; *The Last Judgment*, 5-191 illus.; *Moses*, 4-327 illus.; *David*, 3-53 illus.; 6-385 illus.
Michelson (mi'kel'son), Albert Abraham (1852-1931). Amer. physicist and educator, b. Ger.; investigator of light phenomena; head of dept. of physics at Univ. of Chicago; invented coherent spectroscopy; devised interference method of determining diameter of stars, 7-148.
Michelson-Morley Experiment, and relativity, 6-380.
Michigan. State of the U.S.A.; area 58,316 sq. m.; pop. 3,371,766; cap. Grand Rapids, 5-192.
Michigan, Lake. 3rd largest of Great Lakes (22,400 sq. m.), 2-196, 4-68; map, 4-69.
Michoacan (michōāhkah'n), state in s. Mexico on Pacific, 33,000 sq. m.; pop. 1,182,000; cap. Morelia.
Mickey Mouse. Film cartoon character invented by Walt Disney, 3-92.
Mikolajewicz (mits'kayevich), Adam (1798-1855), greatest of Polish poets; chiefly famous for epics based on the folk tales and legends of his nation.
Mickle Fell. Mt. on borders of Westmorland and Yorks, Eng., 2,591 ft., 6-118, 7-515.
Micro. A prefix signifying the millionth part, chiefly used in electrical work, e.g. microampere, one millionth of an ampere; microfarad, one millionth of a farad. The prefix has as symbol the Greek μ .
Microfarad. Practical unit of elec. capacitance one-millionth of a farad.
Microimeter. 5-192.
Microon. A unit of length, equal to one-millionth of a metre.
Micronesia. A collection of small isl. groups in Pacific Ocean, 6-26.
Micro-organisms. See *Bacteria*; *Germ*; *Protozoa*.
Microphone. 5-193, 6-340 illus. f.
Microphotography. The photographing of subjects of comparatively large area on to small negatives; use in library work, 6-170.
Microscope. 5-194; lens, 4-480; and medical advances, 5-162; optics, 5-522.
Microsomes. In protoplasm, 6-298.
Micro-waves. very short radio waves, 3 cm. to 1 cm. (or less), with frequencies of 1,000 to 30,000 megacycles per sec. (or more).
Midas. In Gk. myth., all he touched changed into gold, 5-198.
Middleader. Tn. in Midlothian. Scot.; pop. 2,591; 5-40.
Middleburg. Tn. in Netherlands. Industries include engineering, furniture, tobacco mfr. In Middle Ages was a cloth centre. Pop. 21,000.
Middle Ages. Period of history from A.D. 395 to about 1500, 5-193, 3-313, 314, 4-180; agriculture, 1-72, 77; architecture, 1-210, 211; armour, 1-243; bathing, 1-384; betrothal customs, 5-134; boots and shoes, 2-13; bread, 2-50; castles, 2-256; cathedrals, 2-261; Christmas festival, 2-381; cookery, 2-496; drama, 3-117; fairs and wandering entertainers, 2-404; feudal system, 3-348; football, 3-414; gloves, 4-35; Gothic sculpture, 6-520; guilds, 4-103; hats and caps, 4-136 illus. f.; Heraldry, 4-164; illuminated manuscripts, 4-117; knighthood, 4-417; Latin as international language, 4-449; meals, 5-152; medicine, 5-162; music, 5-304; monks and monasticism, 5-243; roads, 6-410; importance of salt, 6-490; shops, 3-314 illus.; text books, 6-301.
Middle Congo. Territory of French Equatorial Africa, cap. Brazzaville; 2-482, 483.

Middle East Air Force (M.E.A.F.). Overseas command of R.A.F., 6-462.
Middle English. writers and works of period, 3-284.
Middlesbrough. Spt. and mfg. tn. on Tees in N. Riding of Yorks; pop. 147,338; centre of large iron and coal dist., 3-252.
Middlesex. Co. of Eng.; area 232 sq. m., most of which is included in Greater London; pop. 2,268,776; co. tn. Brentford; 6-200.
Middle Temple. London, one of the Inns of Court, close to Law Courts; it is famous for its hall, which was completed in 1572; the carved oak roof was one of best specimens of Elizabethan work in London; bombed by Germans in 1940 it was repaired, and reopened 1949; 5-21.
Middleton, Thomas (1580-1627). Eng. playwright; coarse, cynical, sometimes powerful writer; plays include *A Trick to Catch the Old One* (1608), *A Game of Chess* (1624); 3-285, 3-119.
Midgard. In Norse myth., the Earth.
Midgardsorm or **Midgard Serpent**, in Norse myth., serpent encircling the earth.
Midgets, compared with dwarfs, 3-140.
Midlands. Eng., 3-249.
Midlothian. Scot. co., area 370 sq. m.; pop. 565,746; co. tn. is Edinburgh; 5-39.
Midnight Sun. 5-200 with illus. f.; in Norway, 5-462.
Midshipman. Lowest rank of commissioned officer in Royal Navy; insignia, 5-351 illus.
Midsummer Day. In British Is. June 24; in Polar regions, 5-200.
Midsummer Night's Dream. A. Comedy by Shakespeare, 5-200.
Midway Islands. Hawaiian Isls. group (U.S.A.), midway between Asia and America; on trans-Pacific air route U.S. naval victory, Jun. 1942.
Miguel (migel'), Dom Maria Evaristo (1802-66). Portuguese prince and pretender, 3rd son of John VI, and uncle of Maria da Gloria, whose throne he usurped (1828-34).
Mignon. Opera by Ambroise Thomas; story, 5-519.
Mignonette. A flowering plant, 5-202.
Migration, Animal. 5-202; of birds, 1-456, 5-204 illus. f.; of bison, 1-476; of lemmings, 4-477; of eels, 3-170.
Migration, Human. 5-203.
Mihajlovitch (mihajlovich), Draza (1893-1946). Yugoslav soldier; on Ger. invasion of Yugoslavia 1941, he raised guerrilla forces, Chetniks, against invaders; given money and equipment by Allies until May 1941; min. of war in exiled Yugoslav govt.; accused by Tito of collaboration with Germans; tried and shot as a collaborator July 1946; 7-520.
Mikado. Poetical name for Jap. emperor used only by foreigners; 4-344.
Mikolajczyk (mikhilichik), Stanislaw (b. 1901). Pol. statesman; head of Peasant party in 1947; defended Warsaw against Gers. 1939; escaped to London, succeeding Sikorski as prime min. 1943; in Warsaw in 1945 became vice-premier, but by 1947 in opposition; persecuted, he fled to Eng. and thence to U.S.A.
Mill. A unit of length, equal to one-thousandth of an inch. The Circular Mill is a unit of area, equal to the area of a circle of which the diameter is one-thousandth of an inch.
Milan. City of Italy; pop. 1,293,000, 5-204.
Milanion. Gk. youth who beat Atalanta in a race by the stratagem of the three golden apples, and so married her, 1-285.
Milan Obrenovich IV (1854-1901). Prince of Serbia; succeeded (1868); secured Serbian independence and became king (1882); abdicated 1889 in favour of his son, Alexander I.
Mildenhall Treasure. A hoard of Roman silver ploughed up in Suffolk during 1942-43; bowls, etc., 6-439 illus.
Mildews, compared with moulds, 5-284.
Mill. nautical, 5-338.

MILLOM

Miletus (mil'etus), great maritime city and republic on Aegean Sea in anc. Ionia, Asia Minor; coloniser and centre of learning; sacked by Persians, 494 B.C.
Millford Haven. Spt. in Pembrokeshire, Wales; one of the finest natural harbours in United Kingdom; pop. 11,717; 6-110 illus.
Millonias Zonas. Moth, 2-143 illus.
Military Cross (M.C.). Brit. decoration, 5-530.
Military Medal (M.M.). Brit. decoration, 5-530.
Militia (mil'ish'a). Civilians liable to receive occasional military training; in the United Kingdom they were superseded by the Territorial Force (now Territorial Army) in 1908; conscripts of 1939 were called militiamen.
Milk. 5-205; bacteria destroyed by ultrasonics, 7-344; in butter-making, 2-134, 135; in cheese-making, 2-313; 314; cream as a colloid, 2-455; dairy farming, 3-26; food value of, 3-409; in margarine, 5-124; pasteurisation, 7-344; protein in 6-297, vitamins in, 7-404.
Milk Hill (964 ft.), highest point in Wiltshire, England, 7-456.
Milk Marketing Board. 3-27.
Milk of Sulphur. 7-187.
Milk Puddings. 2-488.
Milk Sugar (lactose), 7-186.
Milkweed Butterfly, egg, 3-171 diag.
Milky Way. Irregular band of diffused white light which encircles the entire heavens at an angle of 63° to the celestial equator. Its appearance is due to the earth being situated well out on one spoke of a wheel-shaped system of stars, luminous dust, and gas; 7-118, 1-281; nebulae, 5-360 stars in, 1-284.
Mill, James (1773-1836). Brit. philosopher and economist, whose strong personality and brilliant conversation added to influence of his books (*History of British India*; *Analysis of the Human Mind*, his greatest work); father of John Stuart Mill.
Mill, John Stuart (1806-73). Brit. philosopher, economist, and scholar, 5-207, 3-160, 3-291, 6-160; and Bentham, 1-430.
Millais, Sir John Everett (1829-96). Brit. painter, one of the original Pre-Raphaelites, 5-207, 3-264, 6-285; Christ in the House of His Parents, 3-270 illus.; Pizarro, 5-203 illus.; St. Bartholomew's Day, 4-201 illus.; St. Stephen, 5-138 illus.; Thomas Carlyle, 2-24 illus.
Millay, Edna St. Vincent (1892-1950). American poet, 7-366.
Millbank. Dist. in Westminster, London, on the left bank of the Thames deriving its name from prison in existence 1812-93; here are the Tate Gallery, and vast office blocks such as Thames House and Imperial Chemical House.
Millennium. The kingdom of Christ on earth, period of 1,000 years preceding the Last Judgment, belief in it is based on Revelation.
Miller's Thumb. Small fish, *Cottus gobio*, common in fresh water, so called because of its large flat head; known also as bull-head; has spiny fins.
Milles, Carl (1875-1953). Swedish sculptor. Garden at Lidings admirably displays works in natural vistas; Copenhagen mermaid, illus. 2-501.
Millet, Jean Francois (1824-75). Fr. painter of peasant life, 5-208, 3-410; *The Angelus*, 3-446, illus.
Millet (corn). General term for a number of grasses grown for grain and forage, important sources of human food in China, India, Africa, southern Russia, and the Balkans.
Milligram, Millilitre, Millimetre. See *under Metric System*, 5-181 and *Weights and Measures*, 6-525.
Millin, Sarah Gertrude (b. 1869). African author, 7-92.
Military, fashions in women's hats, 4-137.
Millipedes, in zoological classification, 1-154.
Millom. Tn. in Cumberland, Eng.; pop. 7,500; ironworks, 3-10.

MILLS

Mills, Bertram (1873-1938). Brit. showman; his circus, 2-403.
Mills, Edward D. Brit. architect; work, 1-214 illus., 1-219.
Mills Grenade. Hand grenade invented by Sir William Mills (d. 1932).
Millwall. Dist. of S. London, in the Isle of Dogs; name derived from seven windmills which once stood on river-bank; Millwall Docks centre of grain trade.
Milne, Alan Alexander (1882-1958). Brit. author and playwright, 5-208; children's books, 2-356, 357.
Milner, Alfred Milner, Viscount (1854-1925). Brit. statesman and colonial administrator; High Commissioner for S. Africa (1897-1905); sec. of state for war (1918-19); sec. of state for colonies (1919-21).
Milo (Greece). See Melos.
Milo (Milo) or Milon (6th cent. B.C.). Gk. athlete; crowned 6 times at Olympic Games and 6 times at Pythian Games for wrestling; carried an ox through stadium.
Miltiades (miltiádes) (d. c. 488 B.C.). Athenian general, victor over Persians at Marathon (490 B.C.), 1-227.
Milton, John (1608-74). Eng. poet, 6-209, 3-286; and sonnet form, 6-234.
Milvian or Mulvian Bridge. Anc. bridge over Tiber on Flaminian Way where Maximilian was drowned following his defeat by Constantine, A.D. 312, 2-489.
Milwaukee, Wisconsin, U.S.A. Spt. and largest city of state, on w. shore of L. Michigan; large general trade pop. 632,561; 7-464.
Milyukov (milyúkov), Pav (1859-1913). Rus. historian and statesman, leader of Constitutional Democrats in rev. of 1917.
Mim'idae. Mocking-bird family.
Mim'osa. Any of various shrubs or trees of the bean family, *Leguminosae*, with sensitive leaves; bark used in tanning; name sometimes applied to wattles; 1-8.
Mimosa pudica, the sensitive plant 6-217 with illus.
Mimosoidae, a sub-fam. of *Leguminosae*. Acacia a member, 1-8; false acacia is also a member of *Leguminosae*.
Min, r. of S.E. China, entering Formosa Strait; part navigable.
Min'arets. Slender balconied towers of mosque from which the faithful are called to prayer, 5-89 illus.
Minch. Strait separating Hebrides from N.W. coast of Scotland.
Mindanao. Southernmost and 2nd largest isl. of Philippines; 36,906 sq. m.; 6-156, 6-25.
Mindanao Deep. Deepest place in the oceans of the world, 6-156.
Min'den, Ger. Old tn. in w., on the R. Weser, near which British and Prussians defeated French (1759) in Seven Years' War, 7-2.
Mine Detector. 5-219, 218 illus.
Minehead. Market tn. and holiday resort of Somerset. Eng. on Bristol Channel, 7-85.
Mineleying, in Royal Navy, 5-348 illus.
Mineralogy, the study of minerals, 5-213.
Mineral Oils. 5-506.
Minerals. 5-213.
Mineral Salts, as body builders, 3-409; in hot springs, 7-139; in milk, 5-503.
Mineral Tanning, in preparation of leather, 4-468.
Miner Bees, life of, 1-409.
Minerva. In Rom. myth., goddess of wisdom, identified with Gk. Athena. See Athens.
Mines and Mining. 5-215; career as mining engineer, 2-238; coal mines, 2-439 illus., 5-217 illus.; geologists, 3-517; gold-mining, 4-40; salt-mining, 6-491, 490 illus.
Mines in Warfare. 5-218; magnetic, 7-488; mine-detecting, 1-250 illus.; minesweepers, 5-349.
Minesweeper. Vessel equipped to clear or neutralise sea mines, 5-349, 5-220, 221.
Ming Dynasty. Ruling dynasty in China 1368-1644; art of, 2-363, 371 illus.

MIXTECS

Minho (mé'nyó). R. forming part of N. boundary of Port., 170 m. long, 6-257.
Minhow. See Foochow.
Miniatures, in illuminated MSS., 2-3; miniature painting in Eng., 3-258.
Miniodos Dissolor. Moth, 2-142 illus.
Minister. One charged with the performance of a duty, such as the representative of the state, a Cabinet minister or ambassador; also a clergyman or priest; particularly applied to pastors of Free Church congregations.
Minister Plenipotentiary. Diplomatic representative, 1-131.
Minister Resident. In diplomacy, 1-131.
Mink. Small fur-bearing animal of the weasel family, 5-221, 3-496.
Minneapolis. Largest town in Minnesota, U.S.A.; pop. 517,277; 5-232.
Minnehaha. ("Laughing Water"), maiden loved by Hiawatha; in story, 5-35.
Minnesingers. Medieval Ger. lyric poets, 4-13; and secular music, 5-304.
Minnesota. State of the U.S.A.; area 84,068 sq. m.; pop. 2,982,483. cap. St. Paul; 5-222.
Minnesota River, U.S.A. Tributary of Mississippi (450 m. long), 6-222.
Minnow. A coarse fish 6-404.
Minosan Culture. 1-24.
Mino da Fiesole (1430-84). It. sculptor; work, 4-363 illus.
Minor. See Musical Terms (list).
Minorea (minor'ka). Second largest of Balearic Is.; 290 sq. m.; pop. 380,000; fine harbour at Port Mahon; 1-349 illus.
Minorites. Same as Franciscans.
Minos (mi'nos), in Gk. myth., king and lawgiver of Crete, son of Zeus and Europa, father of Ariadne; after his death, judge in underworld; and Daedalus, 3-25; and the Minotaur, 7-268.
Minotaur (mi'nótawr). In Gk. myth., bull-headed man-monster, eater of human flesh; imprisoned by Minos in Cretan labyrinth; killed by Theseus, 7-268.
Minak. Cap. of White Russia, U.S.S.R., on r. Svislocha, city 400 m. s.w. of Leningrad; pop. 239,000; 6-479.
Minster Lovell. Village in Oxfordshire, Eng., 6-21 illus.
Ministry of the Scottish Border. Collection of poems by Sir Walter Scott, 6-317, 1-351.
Mint. A genus of herbs, 5-222.
Mint, Royal, London. 5-223, 5-20.
Mintha. In Gk. myth., a nymph changed by Persephone into the mint plant, 5-222.
Minuet (mínúet'). Old-fashioned dance music in triple measure, 5-305.
Miocene Period. In geology, 3-515, 516.
Miquelon (míkélón). Fr. isl. group near S. coast of Newfoundland forming (with St. Pierre) an Overseas Territory; 83 sq. m.; cod fisheries.
Mirabeau, Gabriel Honoré Victor Riqueti, Comte de (1749-91). Fr. Rev. statesman, 5-224; in Fr. Rev., 3-467, 468; portrait, 3-466.
Miraflores Lake. Panama canal, 6-58 illus.
Mirage. An optical illusion, 5-224.
Mirandola, Pico della (1463-94). It. writer; and Gk. studies, 4-313.
Mir'iam. Hebrew pr. hetess, sister of Moses (Exod. II; xv, 20).
Mir Jafar. Indian general and ruler; and Clive, 2-411.
Miron (5th cent. B.C.). Greek sculptor, 4-89.
Mirror. 5-225; concave, 3-350; in microscope, 5-195; and stereoscopic devices, 7-156; of telescopes, 7-248.
Misérables, Les. Novel by Victor Hugo, pub. 1862, 4-201.
Mishnah. The. Part of the Talmud containing the oral law of the Jews, written in Hebrew; 4-161.
Miskolc. Tn., Hungary; pop. 109,433; 4-205.
Mistle Thrush. Bird; why so-called, 5-228, 7-271.
"Missing Link." In Man's evolution, 1-180.

Mississippi. State of U.S.A.; area 46,718 sq. m.; pop. 2,178,914; cap. Jackson; 5-227.
Mississippi. Greatest r. of N. Amer., 2,466 m. long, and with the Missouri, its longest tributary, 3,872 m. long, 5-225; floods, 3-330 with illus.; levees in delta, 5-400, 5-451 with illus.; lumber rafts, 5-50; river system, 5-452.
Missolonghi (mi-olón'gi) or Mesolonghi. Tn. in w. Greece on Gulf of Patras; cap. of Aetolia and Acarnania; pop. 9,200; brilliantly defended against Turks in War of Liberation 1822-26; scene of Byron's death, 2-148.
Missouri. State of U.S.A.; area 69,674 sq. m.; pop. 3,954,653; cap. Jefferson City; 5-227.
Missouri. Chief tributary of the Mississippi, 2,714 m. long, 5-227, 5-452.
Mist, behaviour as an aerosol. 2-455.
Mistletoe. A parasitic evergreen shrub, 5-228; in Balder story, 1-319; Druids and, 3-128; Golden Bough legend, 3-461, 462; and mistle thrush, 7-271; and superstitions, 2-381.
Mistral, Gabriela (b. 1889). Chilean poet and educationist, 7-101.
Mistral. A strong, cold, north-west wind, which blows from the central plateau through S. Fr., 7-459.
Mitch'am. Tn. in Surrey, 4 m. N.W. of Croydon, on r. Wandle; pop. 67,273; lavender and mint formerly grown.
Mitchell, Margaret. Pen-name of American novelist, Mrs. Margaret M. Mitchell Marsh, who in 1936 pub. record breaking "best-seller," *Gone With the Wind*, winning Pulitzer prize killed in road accident Aug. 1949.
Mitchell, Reginald John (1895-1937). British aircraft designer; Spitfire, 2-78.
Mitchell. R. of Queensland, 220 m. long, flowing into Gulf of Carpentaria, 6-322.
Mitchell, Mt. Highest peak in Blue Ridge Mts., N. Amer. (6,711 ft.), 5-452.
Mites. Tiny parasitic animals related to spiders.
Mitford, Mary Russell (1787-1855). Brit. novelist (*Oug Village*); charming unpretentious sketches from life.
Mithras (mith'ras). Persian god of sun and truth, whose worship was last great Asiatic cult imported into Rome before establishment of Christianity; Mithraism very prevalent in Roman army; many striking resemblances to Christianity in doctrine and rites.
Mithridates (mithridá'téz) or Mithridates, the Great (131-63 B.C.). King of Pontus, waged wars against Rome in Asia Minor, exalted in legend for his culture, courage, physical strength, and skill in use of weapons; said to have poisoned himself; 6-433.
Mithridates I (reigned c. 171-138 B.C.). King of Parthia; and expansion of Parthian empire, 6-131.
Mithridates II (reigned c. 120 B.C.-88 B.C.). King of Parthia; extended eastern boundaries of Parthian empire; trade with China, 6-131.
Mitochondria. In cell-structure, 2-286 6-298.
Mitral Valve. Of heart, 4-144.
Mitre. See Architectural Terms.
Mitre. Headdress of bishops and certain abbots of w. church.
Mitscherlich, Edward (1794-1863). Ger. chemist, established (1819) principle of isomorphism in crystals; discovered nitro-benzene, etc., and the optical activity of tartaric acid; and polarised light, 7-228.
Mittelhorn. Peak of the Wetterhorn, in the Bernese Oberland, Switz.
Mittenwald. Tn. on the boundary between Austria and Bavaria; a favourite holiday resort, 1-388 illus.
Mixtecs. Anc. people of Mexico, 1-331.

MIZPAH

Mizpah or **Mispeh**. Name of several places in Palestine; most important Mizpah of Gilead, where Jacob raised heap of stones and made covenant of peace with Laban (Gen. xxxi, 49).
Mjölnir (myélnér). In Norse myth., hammer of Thor, 7-270.
Mjøsen. Largest lake in Norway; 140 sq. m.; 5-481.
Mnemonics. Artificial devices to aid memory, 5-167.
Memnosyne (némos'ínè). In Greek myth., daughter of Uranus and Gaia, and mother of the Muses, the personification of memory.
Mo'a. R. in Cuba rising in E. end of Sierra Maestra Mts.; flows into Guantanamo Bay; 300-foot cascade.
Moa. Extinct bird of New Zealand, similar to emu, flightless but with long and powerful legs; remains of 20 species found.
Moab (mô'ab) or **Mo'abites**. Semitic tribe living in anc. Palestine E. of Dead Sea and the Jordan.
Mobile (-blé). Alabama, U.S.A., spt. and 2nd city of the state; pop. 127,010; trade in iron and steel products, cotton, lumber; original city founded in 1792 by the French.
Mobile Libraries, 4-187.
Moccasins. Red Indian shoe, usually made of deerskin or other soft hide.
Mocha (mô'ka) or **Mokka**. Fortified spt. in Yemen, S. Arabia, on Red Sea; 130 m. W. of Aden; pop. 5,000; coffee trade, 1-195, 2-415.
Mochica. Anc. people of Peru; pottery, 6-142 illus.
Mocking-bird. Bird of N. Amer., resembling the thrush; imitates the notes of other birds, 1-172.
Mock Orange. See *under* Syringa.
Modder. R. of S. Africa. Left bank trib. of the Vaal, flowing through Orange Free State; scene in 1899 of British check in Boer War, when Lord Methuen was wounded in his attempt to relieve Kimberley.
Model Parliament. Name given to parliament summoned by Edward I in 1295, 6-80, 3-167.
Models, 5-228; model aeroplanes, 1-25 illus.; in cinema photography, 2-393; in shipbuilding, 7-11.
Modena (mô'dênâ). City in N. It., 100 m. E. of Genoa; cap. of prov. of Modena; pop. 96,300; fine Romanesque cath.; famous campanile; univ. founded 1083.
Moderato. See *Musical Terms* (list).
Modigliani (mô'déyah'né), **Amedeo** (1884-1920). It. painter, identified with modern Fr. school of art; highly individual in style and technique.
Modjeska (mô'djés'ka), **Helena** (1841-1909). Polish tragic actress on Eng.-speaking stage, best known for Shakespearean rôles (Ophelia, Juliet, Desdemona), 7-67.
Modulation. In radio, varying the frequency, phase, or magnitude of a high-frequency current in accordance with an imposed telephone, telegraphic, or television signal current. For modulation in music see *Musical Terms* (list).
Moel Hebog. Mt. in Snowdonia, Wales. Height 2,366 ft., 7-78.
Moel Siabod (shab'od). Mt. in Snowdonia, Wales. Height 2,860 ft., 7-78.
Moel Syoh. Mt. in Merionethshire, Wales, 2,713 ft., 5-254, 5-175.
Moelwyn. Mt. in Merionethshire, Wales, 2,527 ft., 5-175.
Moelwyn Bach. Mt. in Snowdonia, Wales. Height 2,334 ft., 7-78.
Moelwyn Mawr. Mt. in Snowdonia, Wales. Height 2,527 ft., 7-78.
Moén. Danish isl. in the Baltic Sea between Zealand and Falster, 82 sq. m.; pop. 16,000; very fertile; agriculture and fisheries.
Moesta (mêsh'ia). Anc. prov. S. of Danube corresponding to modern Bulgaria and E. Yugoslavia; settled by Goths about A.D. 376; Slavic tribes settled in 6th cent.
Moffat, **Robert** (1795-1883). British missionary in Africa; a colleague of Livingstone.

MONA LISA

Moffat, **Scot.**. Health resort in Dumfriesshire, 63 m. S.W. of Edinburgh; mineral springs; pop. 2,000.
Moffatt, **James** (1870-1941). British scholar; modern version of Bible 1-443.
Mogadishu. Cap. and chief spt. of Somalia (Italian Somaliland); pop. 70,000; 7-81.
Mogul, **Great**. Popular European name of Indian emperors descended from Babur, the first Great Mogul (d. 1530) 4-251, 5-238, 239 illus.
Mohacs (mô'hach). Market tn. in S. Yugoslavia on Danube; pop. 17,230; coal and silk centre; formerly in Hungary; conquest of Hungary by Turks, 4-206, 7-331.
Mohair. Fleece of the Angora goat woven into cloth, 2-120.
Mohamed Idris el-Senussi (b. 1890). King of Libya. See *Idris I*.
Mohammed I. Sultan of Turkey (1413-21), 7-334.
Mohammed II (c. 1430-81). Sultan of Turkey 1451-81; ambitious, ruthless; gains Constantinople, 7-331.
Mohammed V (1814-1918). Sultan of Turkey, 7-335.
Mohammed VI (1861-1926). Sultan of Turkey, deposed 1922 by Nationalist Assembly; 7-335.
Mohave Desert. A desert region lying principally in San Bernardino co., California; part of Colorado Desert.
Mohawks. Leading Red Indian tribe of Iroquois group, formerly living in lower Mohawk valley, 5-421.
Mohawk Valley. New York state, U.S.A., 5-121.
Mohenjo-Daro. Anc. city in Indus valley, India; excavations and civilization of, 4-251.
Mohicans (mô'hé'kanz). Red Indian tribe and confederacy of Algonquian stock originally living in Hudson valley, later in Massachusetts, Connecticut, and also Pennsylvania, U.S.A., where most of them were absorbed into the Delawares; 6-371.
Möhne (mô'ne) **Dam**, on Möhne R., Westphalia, Ger.; holds back 110 million tons of water to supply Ruhr industry; breached, with Eder dam, by Wing-Comdr. G. P. Gibson, May 1913.
Moh's Scale. Method of finding the hardness of minerals against that of standard metals, ranging from 1 to 10 (1 tale, 3 calcite, 7 quartz, 10 diamond); devised in 1820 by F. Mohs (1773-1839).
Moffa, **Francis Rawdon Hastings**, **Lord** (1751-1826). Governor-gen. of India (1813-22), defeated Maratta princes, 4-252.
Mois. Savage peoples of Indo-China, 4-257.
Moiseiwitsch (moizé'vich), **Benno** (b. 1890). Russ.-born Brit. pianist; friend of Rachmaninov, whose works he interprets brilliantly.
Moissan, **Anwalsahnl**, **Henri** (1852-1907). Fr. chemist; Nobel prize for chemistry in 1906; developed electric furnace for laboratory use and simplified production of acetylene gas; isolation of fluorine, 4-120; and synthetic diamonds, 3-84.
Mokka. See *Mocha*.
Mola, **Gen. Emilio**. Nationalist general in Span. civil war, 7-110.
Molars. Grinding teeth, 7-236 with illus., 5-102.
Molasses. Thick liquor remaining after removal of all crystallisable sugar in the refinery, 7-184.
Mold. Co. tn. of Flintshire, Wales pop. 6,436; 3-389.
Moldau, r., tributary of Elbe, in Bohemia, 1-503.
Moldavia. Republic of the U.S.S.R.; area 13,200 sq. m.; pop. 2,700,000; cap. Kishinev; 6-478.
Mole, r. of Sussex and Surrey, Eng. flows 30 m. to the Thames, 7-196.
Mole. A small insect-eating mammal, 5-231; anatomy of hand, 4-125 illus.
Mole (in physics). See *Gram-molecule*.
Mole Cricket, 2-331.
Molecules. Smallest possible particle of any substance, which can exist independently and still retain its distinctive chemical properties; and atoms, 1-296; behaviour in chemical reaction, 1-11; in gases, 4-520, 3-508; and heat, 6-378; in liquids, 4-520; motion of, 4-146; in proto-plasm, 6-298; in solids, 4-520.
Molière (Jean Baptiste Poquelin) (1622-73). Fr. comic dramatist, 5-231, 3-119; with Louis XIV, 3-455 illus.; Racine and, 6-331.
Molina, **Tirso de** (1571-1648). Span. dramatist, 7-122.
Mollison, **James Allan** (b. 1905). Brit. airman; record solo flight from Australia (1931); solo flights across both N. and S. Atlantic and to and from the Cape.
Molluscs. A group of soft-bodied animals, usually shelled, of a primitive type, 5-232, 1-151; oysters, 6-23; shells, 7-21.
Mollwitz (môl'vitz), Poland. VII, 25 m. S.E. of Breslau; here Frederick the Great defeated Austrians under Marshal Neipperg (1741) in First Silesian War, ceded from Ger. 1915.
Mollymawk. Kind of albatross, 1-92.
Moloch (mô'lok) or **Molech**. Semitic fire-god, whose worship included child-sacrifice, 4-361.
Molokai. One of the Hawaiian Is., 261 sq. m., pop. 5,340; has large leper settlement; 3-34, 4-139.
Molotov, **Vyacheslav Mikhailovich** (b. 1890). Russ. politician. Sec. of the central committee of the Communists of U.S.S.R., 1921. Foreign Commissar, 1939. Signed Rus-German non-aggression pact, 1939; represented U.S.S.R. at most of the important conferences during and immediately after 2nd World War; deputy premier, 1949; foreign min., 1953-56.
Moltke (môlt'ke), **Helmuth Johanne von** (1818-1916). Ger. soldier, nephew of following; superseded as chief of staff by Falkenhayn in Dec 1914.
Moltke, **Helmuth Karl**, **Count von** (1800-91). Prussian field-marshal and chief of staff, greatest strategist of later 19th cent.; reorganizer of Prussian army; planned campaigns against Austria (1866) and France (1870-71), 3-154.
Moluccas or **Spice Islands**. Group of Indonesian Is. in Malay archipelago between New Guinea and Celebes, 192,404 sq. m.; pop. est. 893,100; exports spices, sage, coconuts; discovery, 5-77; 4-257, 1-133.
Molybdenite. A soft grey sulphide of molybdenum; crystals used as radio detectors.
Molybdenum (Mo). Metallic element; atomic no. 42; atomic weight 95.95 3-224.
Mombasa (mombas'sa). Chief tn. and spt. of Kenya, Brit. E. Africa on isl. connected by causeway with mainland; pop. 817,748; rly. terminus; coaling station; 4-400.
Momentum. The power of a moving body to overcome resistance; equals its mass multiplied by its velocity.
Mommsen, **Theodor** (1817-1903). Ger. classical scholar and historian, called by Freeman "well-nigh greatest scholar of all times"; *History of Rome*; Nobel prize for literature in 1903.
Momotombo. Active volcano of Nicaragua on S.W. shore of L. Managua (4,250 ft.).
Momus. In Gk. myth., god of ceasur and mockery who found fault with everything and burst with spite, unable to find flaws in Aphrodite.
Mona. See *Man, Isle of*.
Monaco. Very small state in Europe on Mediterranean in S.E. Fr.; 365 acres; pop. 20,202; Monte Carlo, 5-250.
Monadhilath Mts., Inverness-shire Scot., 4-275.
Monaghan. Co. in Irish Rep. on border between Irish Rep. and N. Ireland; area 498 sq. m.; pop. 65,362; mining and agriculture, 4-284.
Mona Lisa. Portrait of a Florentine lady by Leonardo da Vinci, also

MONARCH

called *La Gioconda* (*The Smiling Woman*), 4-483, 5-47 illus.

Monarch. British cable-laying ship, 2-155 with illus.

Monarch Butterfly, migration, 5-202 with illus.

Monarchy [mon'ar'ki]. System of government in which supreme place is held by a king (or queen ruling in her own right), e.g., Gr. Brit., Sweden, Netherlands.

Monasteries, 5-199, 5-243; care for the sick, 5-485; copying of MSS., 2-3; education of boys, 6-503; dissolution under Henry VIII, 4-161, 7-466, 1-3; histories written by monks, 4-181. *See also* Monks and Monasticism.

Monasticism. *See* Monks and Monasticism.

Monastir. Turkish and more familiar name of Bitol, tn. in Yugoslavia; pop. 32,000; has tanneries, carpet works, hosiery factories.

Monazite Sand, 6-496; as source of zirconium, 7-323.

Mönch [mönkh] ("the monk"). A peak of Bernese Alps, Switz. (13,465 ft.).

Moncton. Tn. in New Brunswick, Canada; pop. 27,334; 5-391.

Mondamin. In Longfellow's *Song of Hiawatha*, the personification of Indian corn; in story, 5-35.

Monday. 2nd day of week; meaning of name, 3-55.

Mondovi [mondó'vó], It. City 55 m. w. of Genoa; scene of Napoleon's victory over Sardinians (1796).

"Monel". Metal. Alloy of nickel, copper, manganese and iron, 5-432.

Monet [móné], Claude (1810-1926). Fr. landscape painter, one of the chief originators (with Pissarro, Manet) of the Impressionist school, and therefore a most influential modern painter; captured wonderful fleeting effects of light and atmosphere: 4-237, 3-149; *The Boats*, 4-236 illus.; *The Break-up of the Ice*, 3-117 illus.

Money, 5-233; banks, 1-361; and

gold standard, 4-43; platinum in Russia, coinage, 6-221; Royal Mint, 5-223; silver coins, 7-56; U.K. coinage, 5-223 with illus. f.; and wealth, 3-159. *See also* Coinage; Foreign Exchange.

Mongibello or **Monte Gibello**. Sicilian name for Etna, "mountain of fire."

Mongolia, 5-236.

Mongolian People's Republic. A communist state of Mongolia; cap. Ulan Bator, 5-236 with map.

Mongoliforms. Division of the races of mankind; characteristics, 6-333; Amer. Indian, 6-335 illus.

Mongols. A nomadic people originating in cent. Asia, 5-237; archery, 1-207; in Russia, 6-474; and Tartars, 7-228.

Mongoose. A weasel-like animal of India, 5-239.

Monica, St. (332-387). Christian saint, mother of St. Augustine of Hippo. Festival May 4.

Monists. School of philosophers, which includes idealists, pantheists, and materialists, who refer all phenomena of the universe to a single principle, 6-160.

Mon'tor. A warship of slow speed and shallow draught which carries on the main deck one or two revolving turrets containing big guns.

Monitor. Type of lizard; Komodo dragons, 4-529 with illus.

Monitoring Service, of B.B.C., 6-350.

Monk or **Monk**, George (1608-70), Duke of Albemarle; Eng. Cromwellian general, after Cromwell's death secured Stuart restoration without bloodshed through parliamentary action.

Monkey, 5-240, 7-526, 521 illus.; intelligence, 1-151; genealogical tree, 3-323 diag.; in India, 4-211. *See also* Ape.

Monkey-bread Tree, or **Baobab**. A huge tropical tree.

Monkey-nuts. *See* Groundnuts.

Monkey-puzzle or **Chili Pine** (*Tracuraria imbricata*). Tree, native of the

MONO-RAIL

Andean region, representing a primitive group of conifers. Leaves are sharply pointed, scale-like, and cover branches completely, rendering tree unclimbable. The large, green cones have numerous pointed scales; 3-121.

Monkey's Dinner Bell. Explosive seed-pod of the sand-box tree, 6-528, 529 illus.

Monkhouse, Allan Noble (1858-1936). Brit. playwright; associated with Manchester repertory movement, 3-291.

Monks and Monasticism, 5-243.

Monkshood, or **Wolfsbane**. A plant of the buttercup family, with hooded flowers, yielding aconite; 6-236, 237 illus.; sepals and petals, 3-100.

Monmouth, James, Duke of (1619-85). Pretender to the Eng. throne, the "Protestant Duke." Illegitimate son of Charles II.; regarded as head of English Protestant party; led rebellion against uncle, James II.; defeated at Sedgemoor, captured, and beheaded, 4-339; Jeffreys and Bloody Assize, 4-359; portrait, 3-258.

Monmouth. Co. tn. of Monmouthshire, Eng.; agric. trade, flintplate and chemical works; pop. 5,432; 5-216.

Monmouthshire. Eng. co. bordering Wales; pop. 424,617; area 546 sq. m.; co. tn. is Monmouth; 5-245.

Monoceros [monos'eros] or **Unicorn**. A constellation; cone nebula in 1-283 illus.

Monocotyledons. Sub-group of plants, including grasses, pond-weeds, lilies and orchids, having only one seed leaf, 7-315, 6-529, 6-211.

Monoculus [món'óshul] Plants. Those having both pistillate and staminate flowers.

Monogamy. The union of one man with one woman, 5-133; among birds, 1-457.

Monoplane. Type of aeroplane; compared with biplane, 1-11.

Mono-rail Trains, 4-114 with illus.

MONEY OF BRITAIN AND OTHER COUNTRIES

GOLD COINS		s.	d.		
Sovereign	.....	20	0	Ecuador	..... Sucre (= 100 Centavos)
Half-sovereign	.....	10	0	Egypt	..... Egyptian Pound (= 100 Piastres)
Legal tender to any amount, though in practice they are superseded by Bank of England notes.				Finland	..... Markka (= 100 Penni)
SILVER (Cupro-Nickel) COINS		s.	d.	France	..... Franc (Centime abolished in 1950)
Crown	.....	5	0	Germany	..... Deutsche Mark (= 100 Pfennig)
Half-Crown	.....	2	6	Greece	..... Drachma (Lepta abolished in 1912)
Florin	.....	2	0	Guatemala	..... Quetzal (= 100 Centavos)
Shilling	.....	1	0	Haiti	..... Gourde (= 100 Centimes)
Sixpence	.....		6	Honduras	..... Lempira (= 100 Centavos)
Threepence	.....		3	Hungary	..... Forint (= 100 Filler)
Crowns are minted on special occasions.				India	..... Rupee (= 16 Annas)
NICKEL ALLOY COIN		s.	d.	Indonesia	..... Rupiah (= 100 Sen)
Threepence (12-sided)	.....		3	Iraq	..... Dinar (= 1,000 Fils)
Legal tender up to £2.				Israel	..... Israeli Pound (= 1,000 Prutah)
COPPER (Bronze) COINS		s.	d.	Italy	..... Lira (= 100 Centesimi)
Penny	.....		1	Japan	..... Yen (= 100 Sen)
Halfpenny	.....		1	Jordan	..... Dina (= 1,000 Fils)
Farthing	.....		1	Korea, South	..... Won (= 100 Won)
Legal tender up to 1s.				Lebanon	..... Lebanese Pound (= 100 Piastres)
SOME OF THE CHIEF MONETARY UNITS		s.	d.	Libya	..... Libyan Pound (= 100 Piastres)
Abyssinia	.....			Mexico	..... Peso (= 100 Centavos)
Albania	..... Lek (= 100 Quintars)			Nepal	..... Nepalese Rupee (= 100 Pie)
Argentina	..... Peso (= 100 Centavos)			Netherlands	..... Guilder or Guilden (= 100 Cents)
Austria	..... Schilling (= 100 Groschen)			Nicaragua	..... Cordoba (= 100 Centavos)
Belgium	..... Belgian Franc (= 1/2 Belga)			Norway	..... Krone (= 100 Öre)
Bolivia	..... Boliviano (= 100 Centavos)			Pakistan	..... Rupee (= 16 Annas)
Brazil	..... Cruzeiro (= 100 Centavos)			Panama	..... Balboa (= 100 Cents)
Burma	..... Kyat (= 100 Pyns)			Paraguay	..... Guaraní (= 100 Pesos)
Canada	..... Dollar (= 100 Cents)			Peru	..... Sol (= 100 Centavos)
Ceylon	..... Rupee (= 100 Cents)			Poland	..... Zloty (= 100 Groszy)
Chile	..... Peso (= 100 Centavos)			Portugal	..... Escudo (= 100 Centavos)
Chinese People's Republic	..... People's Dollar			Rumania	..... Lei (= 100 Bani)
Colombia	..... Peso (= 100 Centavos)			Saudi Arabia	..... Saudi Guinea (= 40 Riyals)
Costa Rica	..... Colon (= 100 Centimos)			Siam	..... Baht (= 100 Satangs)
Cuba	..... Peso (= 100 Cents)			Spain	..... Peseta (= 100 Centesimos)
Czechoslovakia	..... Crown or Koruna (= 10 Halers)			Sweden	..... Krona (= 100 Öre)
Denmark	..... Crown or Krone (= 100 Öre)			Switzerland	..... Franc (= 100 Rappen or Centimes)
Dominican Republic	..... Peso (= 100 Centavos)			Syria	..... Syrian Pound (= 100 Piastres)
				Turkey	..... Turkish Pound (= 100 Piastres)
				U.S.S.R.	..... Ruble (= 100 Kopecks)
				Uruguay	..... Peso (= 100 Centesimos)
				Venezuela	..... Bolivar (= 100 Centimos)
				Yugoslavia	..... Dinar (= 100 Paras)

MONOTREMATA

Monotremata. The order of primitive egg-laying mammals, including duck-bills, 5-103, 2-133.

"Monotype." Type-setting machine, 5-246, 7-340, 341 illus.; matrix for, 7-340-41.

Monroe, James (1758-1831). Pres. of U.S.A. (1817-25), Monrovia named after, 4-485.

Monroe Doctrine. Principle held by U.S.A.—"America for the Americans." First formulated in 1823 by Pres. Monroe (1758-1831): "The American Continents are henceforth not to be considered as subjects for future colonisation by any European power"; "We should consider any attempt on their part to extend their system to any portion of this hemisphere as dangerous to our peace and safety."

Monrovia. Cap. of Negro rep. of Liberia, W. Africa; pop. 20,000; named after James Monroe, Pres. of U.S.A., 4-485, 7-440.

Mons. Mining and mfg. city in s.w. Belgium 35 m. s.w. of Brussels; pop. 26,400.

Mons Meg. Early cannon (1456), 1-258.

Monsoon. A seasonal wind of Asia, 5-248, 7-459; monsoon forests, 3-421.

Montagu, Lady Mary Wortley (1689-1762). Eng. beauty, wit, letter-writer, and eccentric character; introduced inoculation against small-pox into England.

Montague, Charles Edward (1867-1928). Brit. author; novels, which show fine sense of style (*A Hind Let Loose*, *Rough Justice*); 3-291.

Montague House, Bloomsbury, London. Original home of the Brit. Museum, on site of present buildings; 2-88.

Montaigne, Michel de (1533-92). Fr. essayist, 5-248, 3-455.

Montalban's Tower, Amsterdam, N. Netherlands, 1-141 illus.

Montana. A N.W. state of the U.S.A.; area 147,138 sq. m.; pop. 591,024; cap. Helena, 5-249.

Montargis (montahrzhé). Fr. tn. in dept. of Loiret, 63 m. s.e. of Paris; pop. 14,013; famous for "dog of Montargis," said to have revealed master's murderer by constantly following him. Mirabeau born at the Château de Bignon near by.

Montanes, Martínez (d. 1649). Span. sculptor, 7-112; statue of St. John, 7-118 illus.

Mont aux Sources. Highest peak in Drakensberg Mts. (over 11,000 ft.), source of Orange r., 5-521, 5-325.

Mont Blanc, *Sci. Blanc*.

Montcalm de St. Vran, Louis Joseph, Marquis de (1712-59). Fr. soldier, 5-249, 6-321, 7-485.

Mont de la Selle, Haiti (9,186 ft.). 4-118.

Monte Bello Islands. Small uninhabited group off n.w. coast of W. Australia in about lat. 20° s., near Harrow Isl. about 80 m. n. of Onslow, W.A.; largest Hermito Isle (6 m. by 3 m.); first Brit. atomic weapon exploded here, 1952, 1-305, 1-322.

Montebello. Vil. in N. It. 40 m. n. of Genoa, where French defeated Austrians in 1800 and 1859.

Monte Carlo. Tn. in principality of Monaco, 5-250.

Monte Cassino. Mt., 1,703 ft. high, overlooking tn. of Cassino, 45 m. n.w. of Naples, and commanding Liri valley and route to Rome; on it stands a monastery, founded by St. Benedict in 529, which was destroyed in 589 by the Lombards, again by the Saracens and the Normans, and totally destroyed in 2nd World War by Allied bombing; rebuilt after war; 1-428, 1-100.

Monte Cristo. Small barren It. Isl. in Mediterranean, about 25 m. s. of Elba; former penal colony.

Montego Bay. Spt. of Jamaica, on N. coast in w. of Isl.; pop. 11,647, 4-337.

Montenegro. A federal republic of Yugoslavia; cap. Titograd, 5-250, 7-483, 7-518; map, 7-519.

Montenotte (montanot'is). Vil. 25 m. w. of Genoa, It., where Napoleon won first victory (1796), defeating Austrians.

Monterey. Rly. and mfg. centre in n.e. Mexico, cap. of Nuevo Leon state; pop. 359,600.

Monterey (monterá'). California, U.S.A. Resort on Monterey Bay, about 100 m. s.e. of San Francisco; pop. 10,000; has picturesque old Span. buildings; first cap. of Calif.; 2-177.

Monte Rosa. Highest peak in Switzerland, 15,217 ft., 7-211.

Montesquieu, Charles Louis de Secondat, Baron de (1689-1755). Fr. philosopher and writer; noted for his *Lettres Persanes* (1721), which criticised the society of his time. His *De L'Esprit des Lois* influenced later political thought in Europe; 3-455.

Montessori, Maria (1870-1952). It. educationist; introduced the Montessori method of teaching, 5-250, 3-166.

Monteverde, Claudio (1567-1633). It. composer; and development of the orchestra, 5-526; opera *Orfeo*, 5-513.

Montevideo. Cap. of Uruguay; pop. 784,000; 5-251, 7-370.

Montezuma (1460-1520). Last king of the Aztecs, 1-331; capture by Cortés, 1-333, 2-513.

Montfort, Simon de (c. 1208-65). Earl of Leicester, Eng. statesman and soldier, 5-252; rebellion against Henry III, 4-102; and first parliament, 6-86; and Konilworth Castle, 4-397.

Montgolfier (mongolfyá), Jacques Etienne (1745-99) and Joseph Michel (1740-1810), sent up first really practical balloon, 1-353 with illus. f.

Montgomery, Bernard Law Montgomery, Viscount (b. 1887). Brit. soldier, renowned in 2nd World War; 5-252; at Alamain, 1-87, 7-192; and D-Day landings, 5-450, 7-194; and Ger. surrender, 7-496.

Montgomery, James (1771-1854). Scot. poet; his *Wanderer* in Switzerland; greatly admired by Byron; hymns, 4-226.

Montgomery, Alabama, U.S.A. Pop. 105,715; rug. centre, cotton market; exports grain, fruit, and vegetables; 4-87.

Montgomery. Co. tn. of Montgomeryshire, Wales; pop. 904; 5-255.

Montgomeryshire. Co. of Wales; area 197 sq. m.; pop. 45,989; co. tn. Montgomery; 5-254.

Month, in calendar. 5-255.

Montmartre. Noted "bohemian" quarter of Paris, 6-84 with illus.

Montmorency, Falls of, Canada. Beautiful cascade over 250 ft. high in r. Montmorency at confluence with St. Lawrence near Quebec.

Montmorillonite. Clay mineral, 2-377.

Montpelier, Vermont, U.S.A. Cap.; pop. 8,599; on Winooski r., in agric. region; granite, flour, lumber, wood-working machinery, and clothes pgs.; 7-392.

Montpellier (monpel'yá). City in s. Fr., 6 m. from Mediterranean; pop. 93,100; noted univ.; large trade in wine, fruit, and silk; makes soap, candles, leather, distilled liquors.

Montreal. Quebec, largest city of Canada; pop. 1,021,520; 5-255, 6-322, 2-202, 2-193; and St. Lawrence r., 6-486; 2-197 illus., 5-254 illus.

Montreal, University of. At Montreal, Quebec; Rom. Cath.; established in 1876 as branch of Laval Univ., Quebec; virtually independent after 1889, reorganized 1919.

Montreux Convention. Agreement on control of Dardanelles, 3-49.

Montrose, James Graham, 1st Marquess of (1612-50). Scot. soldier and poet, 5-256.

Monts, Pierre du Guast, Sieur de (1560-1611). Fr. courtier, founder of Acadia; sent out expedition under Champlain which founded Quebec.

Mont St. Jean, near Waterloo; and battle, 7-428, 429 diag.

MOR

Mont St. Michel (mon-samshel') ("St. Michael's Mount"), rocky Isl. of w. Fr. a mile off coast of Normandy; famous for fortress-abbey, one of the noblest examples of medieval Gothic architecture; 5-448.

Montserrat. In Brit. W. Indies, one of Leeward Is.; 32 sq. m.; pop. 14,300, mostly Negroes.

Montserrat. Jagged mt. 30 m. n.w. of Barcelona, Spain; vast fissure, dividing it into two, said to have occurred at time of Crucifixion; famous monastery, in medieval legend the castle of the Holy Grail, now houses celebrated image of Virgin, visited by many pilgrims.

Monulph, St. (560-99). Bishop of Tongres, Belgium; foundation of Liège, 4-493.

Monument, The. Memorial in City of London of the Great Fire (1666), designed by Christopher Wren; erected 1871-77; 5-20.

Mood, in grammar. 7-390.

Moody, Dwight Lyman (1837-99). Amer. evangelist; with I. D. Sankey (q.v.) visited Eng. several times. "Moody and Sankey" hymns still sung at popular services.

Moody, Helen Wills (b. 1905). Amer. lawn tennis player; won singles at Wimbledon in 1927-30, 1932, 1933, 1935, and 1938.

Moody, William Vaughan (1869-1910). Amer. poet and dramatist, 7-366.

Moon. Satellite of the earth, 5-256 with illus. f.; force of gravity on, 4-67; lunar eclipse, 3-156; and tides, 7-274, 275 illus.; and the zodiac, 7-521.

Moon, Mountains of the. Name given in anc. geography to African range identified in part with Ruwenzori Mts., 7-343.

Moonstone. Variety of feldspar bluish-milky colour, used as gem stone, 3-345.

Moore, Francis (1657-1715). Eng. astrologer, author of *Vox Stellarum* (1700), original of *Old Moore's Almanac*, 1-117.

Moore, George (1852-1933). Irish writer; novels include *Esther Waters* (1891); racy memoirs, as *Confessions of a Young Man* (1888) and *Heart and Farewell* (1911-14), 3-291.

Moore, George Edward (b. 1873). Brit. philosopher; professor of mental philosophy and logic at Cambridge 1925-39; editor of *Mind* 1921-47, 6-160.

Moore, Henry (b. 1498). Brit. sculptor, C.II. 1955; sculpture, 6-522 illus.

Moore, Sir John (1761-1809). Brit. soldier, commander in Sp. against Napoleon at Corunna, 5-259, 6-117.

Moore, Thomas (1779-1852). Irish poet; "Lalla Rookh," "Irish Melodies," and "National Airs," containing many still familiar songs, 4-287.

Moore-Brabazon, J. T. C. See Brabazon of Tara.

Moorfields Ophthalmic Hospital, London founded 1805, 5-162.

Moorfoot Hills, Scot., Blackhope Seat (2,136 ft.), 5-39.

Moorhen. Water bird, 6-353; egg, 1-452 illus. f.

Moors. Mixed Berber-Arabian people of N. Africa, 5-260; defeat at Tours (732), 2-309; in Morocco, 5-261. In Spain, 7-105; the Alhambra 1-111; architecture in Spain, 7-112 115 illus.

Moose. Largest member of the deer family, the Amer. elk, 5-260, 3-60.

Moose Jaw, Saskatchewan, Canada. Industrial, rly., and grain distributing centre, 40 m. w. of Regina; pop. 24,355; flour, lumber, meat-packing products; 6-500.

Moplah. Fanatical Mahomedan sect of Malabar dist., Rep. of India; revolted in 1921-22.

Mor, Antonio (1512-76). Dutch painter known in Eng. as Sir Anthony More, became court painter to Philip II of Spain.

MORACEAE

Moraceae. The mulberry family of plants, including mulberries, hemp, figs, and bread-fruits.

Moraine [mōrān']. Belt of gravel and stones formed by a glacier, 4-25.

Morales, Luis de (1509-68). Spanish painter, 7-112.

Morality Plays. Allegorical plays of Middle Ages, 3-118, 117 illus.

Moral Re-Armament. See Group Movement.

Moras. Loch. Fresh-water loch, Inverness-shire, Scot., 4-275.

Moratorium [moratawr'i-um]. A period of time during which the payment of debts and other liabilities is suspended.

Moravia. Prov. of Czechoslovakia, formerly Austrian; 8,584 sq. m.; pop. 2,840,000; 2-21, 22.

Moravians or United Brethren. Christian sect which arose in Bohemia and Moravia among followers of John Huss; noted for missionary work; 3-464.

Moravians. Slavic race-group, 7-66.

Moray, Earl of. See Murray, James Stuart.

Moray Firth. Large bay on N.E. coast of Scot., 5-261.

Morayshire. Scot. co. formerly known as Elginshire; area 476 sq. m.; pop. 48,211; Elgin is co. tn.; 5-261.

Morbihan. Dept. of Brittany, France, 2-91.

Morchella Esculenta (fungus) See Common Morel.

Mordant. An acid or "biting" substance; to fix dye; 3-131; in etching 3-209.

Mordred, Sir. Enemy of King Arthur in medieval legend, 6-15F.

Morse, Hannah (1745-1838). Brit. writer of verse and of plays and books on moral and religious subjects; later years devoted to philanthropy and encouragement of popular education 2-423.

Morse, Sir Thomas (1478-1535). Eng. statesman, scholar, and writer; 5-262; as martyr, 5-139; household, 6-387; portrait by Holbein, 3-124; canonised 1935; festival July 6.

Morea [mōrō'a]. Modern name for a Greece, anc. Peloponnesus.

Moréau [mōrō]. Jean Victor Marie (1763-1813). Fr. Rev. soldier; victor of Hohenlinden (1800); exiled for alleged conspiracy against Napoleon (1813); killed on battlefield of Dresden.

Morcombe Bay. Inlet on the coast of Westmorland and Lancashire, extending 17 m. Inland, from Fleetwood to Walney Island it measures 10 m. in breadth; Morcambe and Heysham, a seaside resort, seaport, and borough of Lancashire (pop. 37,000) stands on the S. shore.

Morehouse's Comet. 2-469 illus.

Morelia, Mexico. City 130 m. n.w. of Mexico City named from patriot Morelos; pop. 44,300; college of San Nicholas de Hidalgo; textiles sugar, sweetmeats.

Morelos, Mexico. State in S. centre, 1,916 sq. m.; pop. 182,700; cap. Cuernavaca.

Morgan, Charles Langbridge (b. 1891). Brit. writer; novels include *Portrait in a Mirror*, *The Fountain*, *The Judge's Story*; plays, *The Flashing Stream*, *The River Line*.

Morgan, Sir Henry (1835-88). Welsh barrister, 5-262, 6-206.

Morgan, John Pierpont (1836-1913). Amer. banker, financier, and collector, head of Atlantic shipping combine and of U.S. Steel Co. library, 2-454.

Morgan, John Pierpont (1867-1943). Son of the preceding, succeeded to control of his father's banking business.

Morganatic marriage. Marriage of a member of a royal family to one of lesser rank; neither wife nor children receive royal rank and title. Not recognized in U.K., and Royal Marriage Act requires consent of sovereign to marriages of persons of blood royal.

Morgarten. Hill in N. Switzerland, 18

m. s. of Zürich, where Swiss mountaineers defeated Austrian army in 1315; first Swiss victory in struggle for freedom.

Morgen. Ger. word for morning. Used in Scan., Neth., Ger., and S. Africa as a measure of land—perhaps orig. the amount ploughed in a morning. See *Weights and Measures* (list).

Morghen, Raffaello (1758-1833). It. engraver; copied paintings by Leonardo da Vinci, Raphael, and other masters.

Mörke, Eduard (1804-75). Ger. writer, 4-13.

Morin, Paul (b. 1889). French-Canadian poet, 2-203.

Moris'ees ("little Moors"). Mahomedans in Sp. who accepted baptism, and their descendants.

Morisset, Berthe Marie Pauline (1841-95). Fr. painter, 4-237.

Morland, George (1763-1804). Brit. painter of animals and rustic scenes; many of his best paintings are familiar through engraved copies; 3-261.

Morley, Edward W. (1838-1923). Amer. physicist; experiments on the velocity of light, 7-148.

Morley of Blackburn, John Morley, Viscount (1838-1923). Brit. statesman and man of letters, twice sec. for Ireland and once for India, lord pres. of the council 1910-14. "Honest John," last of the philosophic Radicals, wrote *Life of Gladstone*. O.M. 1902.

Mormons. A religious community in Utah, U.S.A., 5-263, 7-371.

Morning Glory. Climbing plant, *Ipomoea purpurea*, popular in Eng. gardens; member of family *Convolvulaceae*.

Morning Post. Famous daily newspaper founded in 1722; absorbed by *The Daily Telegraph* in 1937.

Morocco. Country in N.W. Africa, independent since 1956; area 172,100 sq. m.; pop. 10,000,000; 5-264; colts, 5-234 illus.; intermarriage between Arabs and Berbers, 1-192; in 2nd World War, 7-493.

Morocco City. See Marrakech.

Morocco Leather. 4-468, 469 illus.; in book-binding, 2-10.

Morosa. People of the Philippines, 6-156.

Morot [mōrō]. Aimé Nicolas (1850-1913). Fr. historical and portrait painter; portraits of members of fashionable and artistic world of Paris, battle scenes, etc.

Morpheus [mōr'fūs]. In Rom. myth., dream god, son of Somnus (sleep).

Morphine. Drug manufactured from opium, 5-521, 6-236.

Morphology. Science dealing with form and structure of living organisms, 2-24, 7-526.

Morphy, Paul (1837-84). Amer. chess champion, 2-328.

Morris Gouverneur (1752-1816). Amer. statesman, aristocrat by training and temperament, but ardent supporter of War of Amer. Independence because he believed in its justice; proposed decimal system of coinage and words *dollar* and *cent*.

Morris, Margaret (b. 1891). Brit. dancer and educationist, 3-40.

Morris, Tom (d. 1870). Brit. golfer, 4-41.

Morris, William (1834-96). Brit. poet, artist and social reformer, 5-266 3-291.

Morris Dances. One of the reel variety of Eng. country dances; introduced into Eng. from Spain, 3-407 illus.

Morris-Jones, Sir John (1864-1929). Prof. of Welsh at Univ. Coll., N. Wales; and Welsh language, 7-415.

Morrison, Herbert Stanley (b. 1888). Brit. Labour politician. Minister of transport (1929-31); home secretary (1940-45). Lord president of council and leader of House of Commons (1945-51), C.H. 1951.

Morrison, Robert (1782-1834). Brit. missionary, first Protestant missionary in China (1807); compiled monumental *Chinese Dictionary*.

Morrison, Mt., Formosa (18,695 ft.) 3-423.

MOSQUITO

Morse, Samuel F. B. (1791-1872). Amer. artist and inventor of Morse code, 5-267, 7-237.

Morse Code. In telegraphy, 7-237. alphabet, 5-267, 268.

Mortar. Vessel in which substances are pounded with a pestle; also building material containing lime.

Mortar. Gun with unrifled barrel for discharging bombs at high angles.

Morte d'Arthur. Collection of prose romances translated by Malory from Fr. sources, 5-97, 1-256, 3-284. Holy Grail legend, 4-54.

Mortgage [mōr'gij]. The grant of an estate or other immovable properties in fee as security for the payment of money, and on the condition that if the money be duly paid the grant shall be void, and the mortgagee shall reconvey the property to the mortgagor.

Mortimer, Roger (1287-1330). First earl of March; an adherent of Edward II. after his enemy.

Mortimer's Cross. Battle in Wale of Roses (1461), in Herefordshire, 40 m. s.w. of Birmingham; Edward, Duke of York, defeated Lancastrians, 4-169.

Mortise. See Architectural Terms.

Mortlake. Tn. of Surrey, on Thames, 9 m. s.w. of London (Charing Cross); finishing point of University boat-race; 5-27.

Morton, William Thomas Green (1819-1868). Amer. dentist; work on anaesthetics, 1-142, 5-165.

Morven. Mt. in Caithness, Scot. (2,313 ft.), 2-165.

Mosaic. 5-268; Roman, 4-317.

Mosaic Screen. and television, 7-252.

Mosander, C. G. 19th-cent. chemist, renowned on rare earths, discovering lanthanum (1839), erbium (1843).

Mosciński, Ignace (1867-1946). Polish statesman and scientist; prof. of electro-chemistry at Lvov 1912; organizer of chemical research inst., 1920; with over 600 patents to his credit, he discovered whirling arc method of recovering nitric acid from free nitrogen; president of Poland 1926; re-elected 1933 resigned 1939.

Moscow. Cap. of the U.S.S.R.; pop. (1939) 4,137,000; 5-268, 6-472; Lenin's tomb, 4-479 illus.; shopping queue, 6-478 illus.; Napoleon's retreat from, 5-322, 321 illus.

Moscow-Volga Canal. Artificial waterway in Russ. connecting the Moskva and Volga rs. Built 1933-37 under 2nd Five Year Plan. 79 m. long.

Moseley, Henry Gwyn-Jeffreys (1887-1915). Brit. physicist; discovered relationship of atomic numbers of elements to their structure as revealed by X-rays, in 1913; showed promise of being a second Newton or another Einstein, but was killed in action at Gallipoli.

Moselle [mōzēl'] (Ger. Mosel). R. in N.E. Fr. and S.W. Ger.; flows mainly N.E. to Rhine at Coblenz; valley noted for vineyards, 6-390.

Moses. Leader and law-giver of the Hebrews, 5-270, 6-295, and children of Israel, 4-374; statue by Michelangelo, 5-190, 4-327 illus.

Moses ben Maimon. See Maimonides.

Muslim League. See Muslim League.

Mosley, Sir Oswald Ernald, Baron (b. 1896). Brit. politician; Cons. M.P. 1918-22, Ind. M.P. 1922-24, joined Labour party and was chanc. of the Duchy of Lancaster 1929; founded New Party 1930, and Brit. Union of Fascists 1931; detained Holloway gaol 1941-43.

Mosques. Mahomedan places of worship, usually of Byzantine style of architecture; at Woking 5-85 illus.

Mosquito. Two-winged blood-sucking fly of the genus *Anopheles*, 5-271; in Africa, 1-65; in Arctic regions, 1-222; eggs, 3-172, 171 illus.; malaria caused by, 5-93; in Panama Canal zone, 6-63.

Mosquito, aircraft. synthetic resin glue used in, 6-221.

MOSQUITO COAST

Mosquito Coast or Mosquitia. Strip of land occupied by Mosquito Indians on E. coast of cent. Amer.; now part of Nicaragua.

Moss. A flowerless plant. 5-272, 6-214.

Mostar, Yugoslavia. City 46 m. s.w. of Sarajevo; pop. 20,300; former cap. Herzegovina; fine Rom. bridge.

Mosul (mosool'). City of Iraq on r. Tigris, 220 m. s. of Baghdad; pop. 98,000; 4-278.

Moszkowski (moshko'f'ski). Moritz (1854-1925). Polish composer and pianist.

Motacillidae. Family of birds including pipits and wagtails. 6-205.

Mother Carey's Chickens. Name given to storm petrels. 6-147.

Mother Goose. Pictitious author of fairy tales and nursery rhymes. First mentioned in Charles Perrault's book *Tales of Past Time* (1650). Nowadays a character in pantomime.

Mother-of-pearl or Naore; button trade in. 2-146.

Mother Superior. Head of a convent 5-245.

Motherwell, Scot. Tn. of Lanarkshire, 12 m. s.e. of Glasgow; coal-mining, iron and steel, and engineering works; pop. (including Wishaw) 68,137; 4-441.

Moth-owl. See *Nightjar*.

Moths, compared with butterflies. 2-130; specimens. 2-142, 113, 114 illus.; eye. 3-333 illus.; pollination of flowers. 3-400; and nylon. 6-370; tongue. 7-391; winter moths. 7-461.

Motif. See *Musical Terms* (list).

Motion. Newton's laws of. 5-408; relativity. 6-380.

Motley, John Lothrop (1814-77). Amer. historian and diplomat (*The Rise of the Dutch Republic*). 7-365.

Motor. See *Diesel Engine*; *Internal-Combustion Engine*; *Motor, Electric*; *Motor Vehicle*.

Motor, Electric. 5-275.

Motor-boats. Sir M. Campbell's speed records. 2-192; world record for mile, 202.3 m.p.h., set up by Donald Campbell (44 Britain), in 1955.

Motor-bus, chassis and engine. 5-279, 282 illus.

Motor-car, conveyors in mass production. 2-494; of 1890. 6-113 illus.; Ford and his famous cars. 3-418 with illus.; jet-propelled. 4-371; pumps in. 6-307 diag. See also *Motor Vehicle*; *Internal-Combustion Engine*; *Road Transport*.

Motor Centres, of brain. 2-10, 11 illus.

Motor-cycles. 5-273; motor-cycle racing. 5-110, 5-275, 274 illus.; world record for flying mile: 179 m.p.h. held by Herx (Ger.), 1931.

Motor Nerves, in human body. 5-368.

Motor Vehicle. 5-277; brakes in. 2-44; centrifugal force in turning. 2-293; development of. 6-413; diesel engine. 3-89; internal-combustion engine. 4-273; leather upholstery. 4-467; motor-cycles. 5-273; Nuffield and Morris cars. 5-473; road safety. 6-409; and rubber industry. 6-164; tyres. 6-166.

Mottled Umber Moth. One of the destructive winter moths. 7-462 with illus.

Mottram, Ralph Hale (b. 1883). Brit. author; a leading war novelist, his most famous book being *The Spanish Farm* (1924) (awarded Hawthornden prize).

Mouflon. Wild sheep found in Corsica and Sardinia. 7-20, 22 illus.

Moulds and Mildews 5-283; antibiotics. 1-171, 175; in cheese. 2-311.

Moulin Rouge. Music-hall in Paris. 6-84.

Moulmein. 2nd spt. of Burma, nr. mouth of Salween, exporting teak and rice. pop. 75,000; held by Japs. in 2nd World War from Jan. 1942 to Sept. 1945; seized by rebel Karens 1918 and again 1949 in attempt to force Burmese govt. to grant them promised autonomy.

Moulting, of birds. 1-469; of caterpillars. 2-263.

Mountain Ash. Species of eucalyptus (*E. regnans*). 3-306. For mountain ash (*Pyrus aucuparia*) see *Rowan*.

Mountaineering. 5-284; in Alps. 1-127, 7-212 illus. f.; effects of altitude and air pressure. 1-80; avalanches. 1-328; Everest expeditions. 3-319; on Jungfrau. 1-124 illus.; on the Zugspitze. 1-388 illus.

Mountain Goats, or Goat-antelopes. Animals intermediate between goats and antelopes. The term is often applied to any wild goat—such as the ibex—that lives in mountains.

Mountain Lion. See *Puma*.

Mountain railways, in Switz. 6-358, 359 with illus.

Mountains, influence on civilization. 6-187, 188; heights gauged by barometer. 1-371; and rainfall. 6-360. See also individual mountains by name, and *Mountaineering*.

GREAT MOUNTAINS OF THE WORLD

	HEIGHT IN FEET
Aconcagua, Argentina	23,000
Chimborazo, Ecuador Andes	20,700
Cotopaxi, Ecuador Andes (world's highest active volcano)	19,500
Elbruz, Russia (highest in Europe)	18,467
Etna, Sicily	10,750
Everest, Nepal (highest in world)	29,002
Fujiyama, Japan	12,385
Godwin-Austen, Kashmir	28,278
Kilimanjaro, Africa (highest in Africa)	19,300
Kosciusko, Australia (highest in Australia)	7,328
Logan, Canada (highest in Canada)	19,539
McKinley, Alaska (highest in North America)	20,464
Mauna Kea, Hawaiian Islands	13,784
Mont Blanc, France (highest in the Alps)	15,781
Ojos del Salado, Chile	23,293
Orizaba, Mexico	18,086
Popocatepetl, Mexico	17,987

Mountains of the Moon. Alternative name for the Ruwenzori Range, Uganda. 7-313.

Mountbatten, Louis Francis Albert Victor Nicholas Mountbatten, 1st Earl (b. 1900). Brit. sailor and statesman. 5-287; and partition of India. 4-254, 6-40; succession of daughter to title. 6-106.

Mountevans, Edward Ratcliffe Garth Russell Evans, Baron (b. 1881). Brit. sailor known as "Evans of the Brooke"; Capt. Scott's second-in-command on his last tragic expedition to S. Pole. 6-515.

Mounties, The. See *Royal Canadian Mounted Police*.

Mount Palomar Observatory, California. 5-493 illus.; telescope mirror. 5-225.

Mount Vernon. George Washington's estate overlooking the r. Potomac, in Virginia, U.S.A. Here he died, in 1799. 7-121 illus.

Mount Wilson Observatory, Pasadena, California, U.S.A., 2-177; telescope. 5-194. Sir James Jeans at. 4-358 illus.

Mourne Mountains, N. Ireland. Range of mts. in s. of Co. Down; highest summit Slieve Donard, 2,796 ft., 3-109, 4-281.

Mourning Rings. Article of jewelry: Shakespeare and. 4-372.

Mouse. A small rodent. 5-288; eaten by birds. 1-455.

Moussadeq, Dr. Mahomet (b. 1881). Premier of Persia (1951-53); and oil-nationalisation in Persia. 6-132.

Moustierian Culture. Culture of ape-like people in Britain between 2nd and 3rd Ice Ages; implements. 5-107, 106 illus.; reconstructed dwelling. 2-74 illus.

Mouth, the grinding room. 6-190 illus.; and age of horse. 4-198; in insects. 4-265, 266 illus.; in sharks. 7-18; teeth. 7-236; tongue. 7-200.

MULHACEN

Mouth-organ, musical instrument. 5-288.

Moving-coil Microphone. Type of microphone. 5-193, 194 illus.

Moving stairway. See *Escalator*.

Moviola. Special projector for synchronising pictures and sound in film making; in editing film. 2-394, 395 illus.

Moynihan, Berkeley George Andrew Moynihan, 1st Baron (1865-1936). Eminent Brit. surgeon; wrote books on abdominal conditions; 7-191, 5-165.

Mozambique (Portuguese East Africa); area 297,730 sq. m.; pop. 5,732,767; cap. Lourenço Marques; 6-268, 1-55; Delagoa Bay. 3-65.

Mozart, Wolfgang Amadeus (1756-91). Austrian composer. 5-289, 5-305; and Haydn. 4-142; *The Magic Flute*, 5-518, 514 illus.; *The Marriage of Figaro*, 5-519; *Don Giovanni*, 5-516.

Mrs. Sam McGredy. Variety of rose. 6-152 illus. f.

Mu, H. M. (Hou, in M). Twelfth letter of (Gk. alphabet); the small μ is used as symbol for microscopic measurements; the micron (i.e., millimetre).

Much Ado About Nothing. Romantic comedy by Shakespeare, notable for characters of Beatrice and the determined bachelor Benedick, also comic watchman Dogberry.

Muok, Isl. of the Inner Hebrides. Inverness-shire, Scot. Bird sanctuary. 4-275.

Mucous Membrane. A thin, sheet-like structure lining all passages by which internal organs of body communicate with outer world; has certain cells which form a semi-fluid secretion called "mucus" to protect membrane from irritation.

Mudania (mo'dania). Tn. of Turkey. Sea of Marmora; olive oil.

Mud-fish. See *Lung-fish*.

Mud-skipper. Marine fish of the *Gobidae* family; pectoral fins developed into limb-like organs for walking on land; frequents mangrove swamps in Africa, Asia, and Australia.

Muezzin. Crier who calls Mahomedans to prayer. 5-89 illus.

Mufti. (a) An official expounder of Mahomedan law; (b) civilian dress as opposed to uniform. Turkish Grand Mufti was chief spiritual authority of the land, but office abolished by the Turkish Republic in 1924. For the "Grand Mufti" of Jerusalem, see *Hussein, Haj Mohammed Emir el*.

Mugad'zhar Mts. In Asia, range extending from Ural r. s. almost to Aral Sea; 27,786 ft. highest peak.

Mugwumps, in U.S.A., political nickname applied to independent voters who do not support any particular party; really means "great chief," after an Amer. Indian, so is essentially satirical and disparaging.

Mühlberg (muel'bürg). Ger. tn. on Elbe r., 35 m. s.w. of Dresden; Emp. Charles V. defeated Protestants under Elector of Saxony (1517).

Muir Glacier. Large and picturesque ice sheet of s.e. Alaska, discharging into Glacier Bay; about 350 sq. m.

Mulizz, El. Caliph, conquered Egypt. A.D. 968; and foundation of Cairo. 2-161.

Mukden (mook'den). Largest city of Manchuria, on P'un r., 400 m. s.e. of Peking; in 1932 it became largest city of Japanese Manchukuo; coal deposits. 5-112.

Mulberry. Name of several trees with black, white, or red fruit. 5-289; silkworms and. 7-53.

Mulberry family, or Moraceae. Plant family including mulberries, figs, figs, and bread-fruits.

Mulberry Harbours. Artificial harbours used in invasion of Normandy, June 1944. 5-290, 291 illus.; 2-54.

Mule. Offspring of ass and mare. 5-292.

Mule, Spinning. Crompton's mule. 2-533.

Muleta. Cloth used by matador in bull-fighting. 2-122.

Mulhacen (moolahthan'). Highest summit in Sp., 11,420 ft.

MULHAUSEN

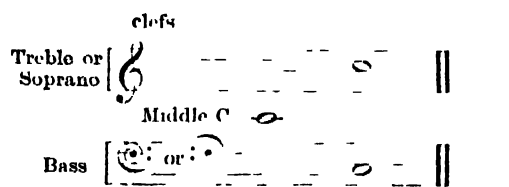
Mulhausen. *See* **Mulhouse.**
Mulheim-am-Ruhr (mül'him-am-roor) (Ger. coal and iron mining and mfg. tn. in Ruhr, 6-468.
Mulhouse (mül'hoz) (Ger. Mulhausen, mül'howzen). Commercial centre in Upper Alsace, pop. 87,650; large textile mfrs.; under Ger. rule, 1871-1918, and Ger. occupation 1910-44, textiles, 3-434, 437.
Mull. Isl. off w. coast of Scotland, traditional home of the clan Maclean; 2nd largest of Inner Hebrides, 367 sq. m.; pop. 3,380; chief tn. Tobermory, where a Span. galleon, said to contain great treasure, was sunk in 1588; 4-152.
Mullah. Complimentary title given to Mohammedan priest.
Mullein. Plants of the order *Scrophulariaceae*, genus *Verbascum*. Great mullein has large leaves covered with matted white hairs; tall spike of yellow flowers. Other species also have yellow flowers, except white mullein, which is also less hairy.
Müller (mü'ler), (Friedrich), **Max** (1823-1900) Anglo-German Orientalist, Sanskrit scholar and populariser of comparative philology, 6-158.
Müller, Hermann J. (b. 1890) Amer. geneticist; did research on the effect of X-rays on the genes and chromosomes of living cells in causing changes in heredity; awarded Nobel prize in 1946.
Müller, Paul (b. 1899) Swiss chemist, discovered insecticidal properties of DDT, received Nobel prize for it, 1948.
Mullet. Name given to two excellent food fishes, the red mullet and the grey mullet, the former a bright red or golden colour.
Mullion. In architecture, a vertical bar separating the compartments of a window, especially used in Gothic and double casement windows; the horizontal bars are called transoms.
Mulock, Dinah Maria. *See* **Craik, Mrs.**
Mulready, William (1746-1863) Irish painter, many of whose subject pictures are familiar through reproductions; he designed the first

postal envelope for Rowland Hill, still known to collectors as a "Mulready envelope."
Multan (mool'tahn'), Pakistan. Riv. centre 190 m. s.w. of Lahore; pop. 142,700; silk and cotton mfrs.; captured by British in 1849; 6-41.
Multilateral, or comprehensive schools, 6-501.
Multiplication. In arithmetic, 5-293; of decimals, 3-58; of fractions, 3-430.
Mumming Plays, 3-115 with illus.
Mummy. Body preserved by embalming, 5-295; in Brit. Museum, 2-88, cypress cases used, 3-20.
Mumtaz Mahal. Wife of Shah Jehan; tomb (Taj Mahal), 7-220 illus. f.
Munch (moo'nk), **Edvard** (1863-1914), Norwegian painter; early works marked by gloomy subjects; later by vigorous landscapes and paintings; leading "expressionist"; 5-467.
Munchhausen (münsh'howzen), **Karl Friedrich Hieronymus, Baron** (1720-97). Ger. soldier, whose fabled exploits formed the basis of a collection of stories (*Munchhausen's Travels*, published 1785).
Mundesley. Holiday resort on Norfolk coast, pop. 990; 5-148.
Munich (Ger. München). Cap. of the Land of Bavaria, Ger.; pop. est. 900,000; 5-295, 4-4, centre of Ger. art, 1-387; Wagner and, 7-409.
Munich Agreement, concluded Sept. 30, 1938, between Germany, Italy, Britain, and France, providing for cession to Germany of Sudeten dist. of Czechoslovakia, 5-296, 3-24, 7-186, 4-183; N. Chamberlain and, 2-300.
Munin. In Norse myth, one of the two ravens of Odin, 5-500.
Munkacsy (moon kah'chē), **Michael** (1814-1900) Hungarian genre, religious, and historical painter; 4-366 illus.
Munnings, Sir Alfred J. (b. 1878). Brit. painter, excelling at horses; pres. of Royal Academy 1944-49.
Munster. Irish Republic. Largest of 4 provs. of Ireland, in s.w.; it was in anc. times a kingdom; 4-281, 284.

MURRAY

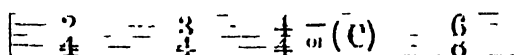
Münster (mën'ster). City of w. Ger. in Land of North Rhine-Westphalia; pop. 119,800; textile and leather, university.
Munthe (moon'te), **Axel** (1857-1919). Swed. physician and writer; physician to King of Sweden 1903, wrote autobiography *The Story of Sun Michele*, about himself and his island home, Capri, 1-447.
Muntin. *See* **Architectural Terms.**
Muntjac, or **Barking Deer**: native to India, 3-60.
Murad II (c. 1403-51). Turkish sultan, ruled 1421-51, 7-334.
Murat (mü rah), **Joachim** (1767-1815). Fr. Rev. cavalry leader and marshal of the empire; husband of Napoleon's youngest sister, Caroline; made king of Naples in 1807; 1-518, 5-322.
Murchison. R. of W. Australia, flowing into Ghantheume Bay; also an important goldfield.
Murcia, Spain. Industrial centre, cap. of prov. of same name in s.e. on r. Segura; pop. 221,209; silk industry.
Murdoch, William (1754-1839). Scot. engineer, 5-296; invented coal gas lighting, 3-505; and steam engine, 7-151, 6-113.
Murex. Genus of molluscs that secrete Tyrian purple, shell, 6-161.
Muriatic Acid. *See* **Hydrochloric Acid.**
Murillo, Bartolomé Estéban (1617-82). Spanish painter, 5-297, 7-121; *Pensante Boy*, 7-112 illus.
Murman Coast. Arctic coast of Kola peninsula, U.S.S.R.
Murmansk. Ice-free apt. of U.S.S.R. on Arctic Murman coast; riv. connexion with Leningrad; fishing; pop. 117,054; base for Allies 1918-19, against Bolsheviks, latter base for Russ. Arctic fleet; and 1939-40 for Russ. attack on Finnish Petsamo; in 2nd World War, terminal port for Brit. munitions convoys to Russ.
Murray, George Gilbert Almé (b. 1866). Brit. classical scholar, best known for translations of plays of Euripides in Eng. verse; chairman of League of Nations Union, 1923-38; O.M. 1941.

MUSICAL SIGNS AND SYMBOLS

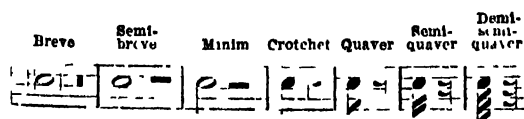




single bar double bars



method of indicating various rhythms






note values and their equivalent rest signs each half the value of that on the left


























 flat  double flat

 sharp  double sharp

 natural (and natural of double sharps and double flats)

 pause  slur

                       <

Murray or Moray, James Stuart, Earl of (c. 1680-70). Half-brother of Mary Queen of Scots and her chief adviser on her return from France; her chief enemy after her open break with Protestantism, and regent for the infant James after Mary's abdication.

Murray, Sir James Augustus Henry; (1831-1915). Brit. lexicographer; editor from 1879 of *New English Dictionary* (Oxford), 2-88.

Murray, Chief of of Australia, draining, with Darling tributary, entire s.w. quarter; mouth on s. coast 40 m. E. of Adelaide; 1-316, 5-402.

Murrayfield. Scotland's international Rugby football ground at Edinburgh.

Murrumbidgee, r. of Australia, tributary of Murray riv.; 1-316, 5-402.

Murry, John Middleton (b. 1889). Brit. literary critic and writer; *Countries of the Mind Keats and Shakespeare*.

Son of Woman (about his friend D. H. Lawrence), *Jonathan Swift*; married Katherine Mansfield, distinguished short-story writer.

Mursuk. A caravan station in Libya cap. of Fezzan; 6-486.

Mus [mūs]. The mouse and rat genus of rodents.

Musaceae. Botanical family; banana, 1-359.

Musa Textilis. See Manila Hemp.

Musca. Insect genus including common flies.

Musca Domestica. The housefly.

Muscarina. A poison found in certain mushrooms, e.g. fly agaric, *Amanita muscaria*, etc.

Muscat. Cap. of Sultanate of Muscat and Oman; pop. 5,500; and pirates, 1-191.

Muscat and Oman. Independent sultanate in s.e. Arabia; fertile region; products, 1-191.

Muscatal Grapes, raisins from, 6-361.

Musci [muskī]. The moss class of bryophyte plants.

Muscles, in anatomy, 5-298, 1-143; proteins in, 3-409.

Muscle Shoals. Alabama, U.S.A.; rapids 37 m. long in Tennessee r. site of Wilson Dam hydro-electric plant.

Muscovite or Muscovy Glass. A form of mica, 5-189.

Muscovy. Former name for Russia.

Muscovy Company. Eng. company formed for trade with Russia and polar exploration, 6-242.

Muses. In Gk. myth., goddesses presiding over the arts and sciences, 5-298; and Orpheus, 6-6.

Museums, 5-289; Brit. Museum, 2-88; in London, 5-27; the Louvre, 5-45; in Munich, 5-295.

Museum of Natural History, New York, 5-301.

NOTED MUSICAL COMPOSERS & THEIR CHIEF WORKS

Johann Sebastian Bach (1685-1750). German. Organ and piano works—"Passion Music"; "Well-Tempered Clavichord."

Béla Bartók (1881-1945). Hungarian. Chamber music. Collected some 7,000 examples of Magyar and Slav music—"Bluebeard's Castle."

Sir Arnold Edward Trevor Bax (1883-1958). British. Symphonies and chamber music—"The Garden of Fand"; "Tintagel."

Ludwig van Beethoven (1770-1827). German. Sonatas, symphonies, quartets—"Pathétique"; "Moonlight," and "Kreutzer" sonatas; "Eroica," and "Pastoral" symphonies; "Egmont."

Hector Berlioz (1803-69). French. Operas and symphonies—"Damnation of Faust," opera; "Fantastic," symphony.

Georges Bizet (1838-75). French. Operas—"Carmen"; "Les Pêcheurs de Perles."

Johannes Brahms (1833-97). German. Songs, symphonies, and concertos—"Requiem"; "Hungarian Dances."

Benjamin Britten (1913-). British. Orchestral and chamber music, and operas—"Serenade"; "Peter Grimes"; "Billy Budd"; "Gloriana."

Frédéric François Chopin (1809-40). French-Polish. Works for the piano—Preludes; Nocturnes, Polonaises; Waltzes.

Claude Achille Debussy (1862-1918). French. Piano and orchestral works; and operas—"La Mer"; "Pelléas et Mélisande."

Frederick Delius (1862-1934). British. Choral, orchestral, and chamber music—"Koanga"; "Brigg Fair"; "On Hearing the First Cuckoo in Spring."

Gaetano Donizetti (1797-1848). Italian. Operas—"Lucia di Lammermoor"; "Don Pasquale."

Antonín Dvořák (1841-1904). Bohemian. Operas, symphonies, and choral works—"Wanda"; "From the New World," symphony; "Slavonic Dances."

Sir Edward Elgar (1857-1934). British. Oratorios, orchestral works, and symphonies—"Dream of Gerontius"; "The Wand of Youth"; "Enigma Variations"; "Nursery Suite."

Manuel de Falla (1876-1946). Spanish. Songs, and ballet music—"The Three-Cornered Hat"; "El Amor Brujo."

Géza Auguste Franck (1822-90). French. Choral and orchestral works—"Redemption"; "Les Béatitudes"; "Symphonic Variations."

Sir Edward German (1862-1936). British. Light opera, songs, and orchestral works—"Merrie England"; "Henry VIII," "Dances."

George Gershwin (1898-1937). United States. Songs, opera, and orchestral works—"Porgy and Bess"; "Rhapsody in Blue."

Christoph Willibald Gluck (1714-87). German. Operas—"Orfeo"; "Alceste"; "Iphigénie en Tauride."

Charles François Gounod (1818-93). French. Sacred works, and operas—"Stabat Mater"; "Faust."

Edvard Hagerup Grieg (1843-1907). Norwegian. Songs, and short orchestral, and piano pieces—"Peer Gynt Suite."

George Frederick Handel (1685-1759). German. Oratorios, and suites—"Messiah"; "Water Music."

Frans Joseph Haydn (1732-1809). Austrian. Symphonies, quartets, and oratorios—"The Clock Symphony"; "The Creation."

Frans Liszt (1811-86). Hungarian. Orchestral works, piano pieces, and songs—"Études de Concert"; "Hungarian Rhapsodies"; "Faust Symphony"; "Liebestraume."

Gustav Mahler (1860-1911). Austrian. Symphonies, and song-cycles—"The Song of the Earth"; "Kindertotenlieder."

Felix Mendelssohn-Bartholdy (1809-47). German. Symphonies, oratorios, and piano pieces—"St. Paul"; "Elijah"; "Songs Without Words"; "Midsummer Night's Dream."

Claudio Monteverdi (1567-1643). Italian. Operas, ballets, and sacred works—"Orfeo"; "Sancta Maria."

Wolfgang Amadeus Mozart (1756-61). Austrian. Operas, symphonies, chamber music, and sacred compositions—"The Marriage of Figaro"; "The Magic Flute"; "Don Giovanni."

Giovanni Pierluigi da Palestrina (1524-94). Italian. Sacred compositions.

Sergei Prokofiev (1891-1953). Russian. Ballets, operas, chamber music—"The Love of Three Oranges"; "Peter and the Wolf"; "Classical Symphony."

Giuseppe Puccini (1858-1924). Italian. Operas—"La Bohème"; "La Tosca"; "Madame Butterfly."

Henry Purcell (c. 1658-95). English. Operas, fantasias, sacred compositions, and songs—"Dido and Aeneas"; "The Fairy Queen"; "Te Deum."

Sergei Rachmaninov (1873-1943). Russian. Symphonies, concertos, and piano compositions—"The Bells"; "Prelude in C Sharp Minor."

Maurice Ravel (1876-1937). French. Ballets, chamber music, and piano compositions—"Daphnis et Chloé"; "Ma Mère l'Oye"; "Bolero."

Gioacchino Antonio Rossini (1792-1868). Italian. Operas—"The Barber of Seville"; "William Tell."

Anton Gregor Rubinstein (1829-94). Russian. Concertos, operas, symphonies, piano compositions, and songs—"Melody in F"; "Eroica Fantasia."

Charles Camille Saint-Saëns (1835-1921). French. Operas, and orchestral works—"Samson et Dalila"; "Danse Macabre."

Alessandro Scarlatti (1659-1725). Italian. Operas, cantatas, and sacred works—"La Rosaura"; "Giuseppina."

Frans Peter Schubert (1797-1828). Austrian. Chamber music, symphonies, and songs—"The Erl King"; "Unfinished Symphony"; "Who is Sylvia?"; "Hark, Hark, The Lark." Robert Schumann (1810-56). German. Songs, orchestral and chamber music, and piano compositions—"Carnaval"; "Scenes of Childhood"; "The Two Grenadiers."

Dmitry Shostakovich (1906-). Russian. Operas, symphonies, ballets, and piano compositions—"The Nose"; "The Golden Age"; "Leningrad Symphony."

Jan Sibelius (1865-). Finnish. Symphonies, tone-poems, and orchestral suites—"Finlandia"; "The Swan of Tuonela"; "Romance"; "Karelia"; "Scenes Historiques."

Bedřich Smetana (1824-84). Czech. Operas, symphonic poems, and piano compositions—"The Bartered Bride"; "Dalibor"; "My Country."

Johann Strauss (1825-99). Austrian. Light opera, and waltzes—"Die Flodernhaus"; "A Night in Venice"; "The Blue Danube."

Richard Strauss (1864-1949). German. Operas and tone-poems—"Salome"; "Elektra"; "Der Rosenkavalier"; "Till Eulenspiegel."

Igor Stravinsky (1892-). Russian. Ballets and orchestral works—"The Firebird"; "Petroushka."

Sir Arthur Seymour Sullivan (1842-1900). British. Comic operas, songs, church music—"The Mikado"; "The Pirates of Penzance"; "Patience."

Karol Szymanowski (1883-1937). Polish. Operas, ballets, chamber music, and songs—"King Roger"; "Mandradora"; "Children's Rhymes."

Piotr Il'yich Tchaikovsky (1840-93). Russian. Concertos, symphonies, songs, ballets—"Pathétique" Symphony; "Francesca da Rimini"; "Nutcracker Suite"; "Swan Lake."

Ralph Vaughan Williams (1872-). British. Symphonies, opera, folk music—"London Symphony"; "Antarctica"; "Hugh, the Drover"; "Job."

Giuseppe Verdi (1813-1901). Italian. Operas—"Rigoletto"; "Il Trovatore"; "La Traviata"; "Aida."

Antonio Vivaldi (c. 1675-1741). Italian. Operas, concertos, church music—"Orlando Furioso"; "Stabat Mater."

Richard Wilhelm Wagner (1813-83). German. Operas—"Lohengrin"; "Tannhäuser"; "The Ring Cycle."

Sir William Turner Walton (1902-). British. Ballet, chamber music and concertos—"Beethoven's Feast"; "The Quest"; "Viola Concerto."

Carl Maria Friedrich Ernst von Weber (1786-1826). German. Operas, piano compositions—"Der Freischütz"; "Oberon."

MUSHROOM

Mushroom. Edible fungus, 5-301, 5-489; spores, 6-539 illus.
Mushroom jelly-fish, 4-360 illus. f.
Musie, 5-368; careers in music, 2-238; Indian music, 4-250; jazz, 4-357; opera, 5-513; orchestra, 5-526; and development of piano, 6-196; Purcell and music in Eng., 6-311; singing, 7-57; time in, 7-279. *See also* names of individual musicians and Musical Instruments.
Musical Instruments, 5-307; among anc. peoples, 5-302; bagpipe, 1-347; banjo, 1-361; bells and bell-ringing, 1-424; oello, 7-402; clavichord, 5-309; double-bass, 7-402; drum, 3-128; harp, 4-133; harpsichord, 6-194; horn, 4-194; mouth-organ, 5-288; orchestra, 5-526, 528 illus.; organ, 6-1; piano, 6-194; recorder,

5-309; spinet, 6-194; and sound waves, 7-87; trumpet, 7-392; viola, 7-402; violin, 7-401; wood-wind, 7-473.
Musk. A perfume obtained from the glands of animals, especially musk-deer, 6-124.
Musk-Deer, 5-309.
Musket. Firearm, 3-359, 358 illus.
Musketeer, of 1609, 3-357 illus.
Muskogee [muskô'gêl], Oklahoma, U.S.A. Mfg. city and distributing centre in E near Arkansas r.; pop. 37,289; in agricultural and stock-raising region; oil and natural gas near by.
Musk-Ox. Animal, 5-309, 1-220.
Musk Plant, 5-310; flowers, 3-399.
Musk-Rat, 5-310; fur from, 3-196.
Musk Thistle, 7-270.

MUSS-ALLA-DAGH

Muslim (or Moslem) League. Formed 1906 by Ind. Muslims, aiming at more power in Ind. affairs; weakened by dissensions until 1931; under prov. Mohamed Ali Jinnah it obtained (1947) an independent Muslim state, Pakistan, 6-39, 4-254.
Muslims. Believers in the doctrine of Islam or Mahomedanism; in Algeria, 1-109; in India, 4-254; influence on art in India, 4-249; invasions and conquest of Punjab and Ganges basin, 4-251; status of women, 5-135. *See also* Mahomet and Mahomedanism.
Muslin. Name given to various kinds of cotton cloth, 2-120.
Musquash. *See* Musk-Rat.
Muss-Alla Dagh. Mt. in Rhodope Mts., Bulgaria, height 9,613 ft., 1-350.

A LIST OF THE CHIEF MUSICAL TERMS

A capella. Unaccompanied singing by several voices in the manner of Church music.
Accelerando. Increase the speed.
Accent. The emphasis on certain notes or chords.
Accidental. A sharp, flat, or natural not a part of the key in which the composition is written.
Adagio. Slow; also, a slow movement in a composition.
Ad libitum. At the pleasure of the performer.
Allegretto. Moderately quick, not as fast as *Allegro*.
Allegro. Quick, lively, merry.
Andante. Smooth, flowing, and rather slow in tempo.
Animato. In a lively, spirit-a manner.
Answer. Repetition of a motif or theme by voices or instruments other than the one which introduced it.
Anticipation. The introduction of a note before the sounding of the chord of which it is a part.
Aria. Literally an air, or melody; in opera, an important lyrical solo with instrumental accompaniment.
Arpeggio. A chord, the notes of which are played separately but in quick and regular sequence, as on the strings of a harp.
A tempo. In strict time.
Bar. A vertical line on the staff, used to separate measures; the music between two such lines.
Barcarolle. A song of the Venetian gondoliers, or an imitation of such a song. It is usually in a smooth-winged tempo, suggestive of the graceful motion of a small boat.
Berceuse. A lullaby.
Cadence. A succession of chords or notes bringing a composition, or melody or harmonic progression to its conclusion.
Cantabile. Song-like.
Canzonetta. A simple, short song, bright and light in character.
Chant. A short form of Church music in which words, often from the canticles or the psalms, are intoned usually without rhythm on two reciting notes, each followed by a cadence.
Chord. Two or more notes heard at the same time; its varied structure and relationships are governed by the rules of harmony.
Chromatic. Progressing by semi-tones.
Clef (C^r. key). A sign placed at the beginning of the staff to determine the pitch of notes thereon. The clef actually fixes the position of one note—G, C, or F—and others are found by relation to it.
Concerto. A work of symphonic proportions, in sonata form, for a solo instrument and orchestra.
Crescendo (cresc.). Increase the volume or loudness of tone.
Degree. The step between two consecutive notes in a scale.

Diatonic. Progressing according to the diatonic scale; that is, the standard major or minor scale of eight notes.
Diminuendo (dim.). Decrease the volume or loudness of tone.
Entr'acte. Music performed between the acts of a play or opera.
Finale. The last number in an opera, usually sung by soloists and chorus; or the concluding movement of any musical composition.
Flat. A sign (♭) which lowers a note one semitone.
Forte (f). Loud; *fortissimo* (ff), very loud; *fortississimo* (fff), as loud as possible.
Grace Note. A short note introduced as an ornament and not an essential part of the melody.
Intermezzo or Interlude. A short piece played between the acts, stanzas, or movements of a longer work. It may be played as a separate composition.
Interval. The difference in pitch between two sounds.
Key. The scale, chords, and tonal relationships grouped around a given tonic, or key note, as C is the key-note or first in the scale of the key of C major or minor.
Largo. Broad, slow, stately.
Legato. Smoothly, gliding; opposite of *staccato*.
Libretto (It., the book). The text of an opera, or other musical composition.
Major. Literally, greater; used of intervals which are greater by a half-tone than minor or smaller intervals; used also of keys and of chords in which such intervals predominate.
Measure. The notes between two bar-lines. Commonly called a "bar," it is a unit of rhythm since each measure has but one principal accent.
Melody. A succession of notes forming a tune or air; the leading part in a harmonized composition.
Metre. The regular succession of accents which establishes the rhythm of a composition.
Mezzo. Literally, half, medium; often used with other words, as *mezzo forte*, moderately loud.
Minor. Literally, smaller; used of an interval which is a half-tone smaller than the corresponding major interval, of chords containing such intervals, and of scales in which such intervals predominate.
Moderato. At moderate speed.
Modulation. A transition from one key to another by a succession of related chords.
Motif. A distinguishing musical phrase which usually recurs frequently in a composition.
Natural. A sign (♮) placed before a note to nullify a sharp or flat previously indicated.

Natural scale. The scale of C major.
Nocturne (night piece). A composition in a tranquil, dream-like mood.
Obligato. An accompaniment which is not essential to the composition; usually written for a single instrument which supplements the leading part taken by another instrument or voice.
Octave. An interval of eight diatonic degrees.
Opera. A drama set to music and acted upon the stage.
Oratorio. A composition similar to an opera but often founded on a Biblical theme, and usually given without action or scenery.
Overture. An introduction to opera or other musical work; a concert overture is an independent composition for orchestra.
Phrase. A short passage more or less complete in itself, expressing a musical idea or thought.
Piano (p). Soft in tone; *pianissimo* (pp), very soft.
Prelude. An introduction to prepare for succeeding parts of a composition; sometimes applied to independent pieces of a rather informal character.
Presto. Very fast; *prestissimo*, as fast as possible.
Recitative. Musical recitation to set forth narrative portions, especially in the older oratorios and operas.
Rhythm. The metrical quality of music produced by regularly recurring accents.
Rondo. Musical form in which one principal theme is repeated three or more times, alternating with two secondary themes.
Scale. A series of notes ascending or descending in regular order.
Scherzo. A joke. A tuneful, vivacious movement, often a part of a sonata, concerto, or symphony.
Score. A copy of all the vocal and instrumental parts in a composition, the notes of which are to be sounded simultaneously being placed one above the other.
Sforzando. Strongly accenting a note or chord.
Sharp. A sign (♯) which raises a note one semitone.
Sonata. The most important form of classical chamber music.
Sostenuto. Sustained.
Staccato. Detached, separated.
Staff, or Stave. Five horizontal lines used in musical notation.
Symphony. A work for orchestra in sonata-form.
Synopation. A change in the regular rhythmic pattern by stressing a note on an unaccented beat.
Tempo. The speed at which a composition is to be performed.
Theme. A melody; an air; a principal subject in sonata-form.
Tonic. The first note in any scale; the key-note.
Vivace. Lively, animated.



MUSSEL


Mussel. A shellfish, 2-437, 5-232, 7-21 illus. f.
Musselburgh. Tn. in Midlothian, Scot.; pop. 17,012; battle of Pinkie (1547), fought near by, 5-39.
Musset (mū'sē), Alfred de (1810-57). Fr. dramatist, poet and novelist, early in life was a member of the circle of romantics of whom Victor Hugo was chief.
Mussolini, Benito (1883-1945). It. statesman and dictator, 5-310; and Fascist revolution, 3-341, 4-316, 7-484; and the Munich Agreement (1938), 7-486; annexation of Albania, 7-486; in 2nd World War, 7-494; death, 7-496.
Mussorgsky, Modest Petrovich (1839-81). Russ. composer, 5-306, 5-515
Mustagh Mts. See Karakoram.
Mustapha IV (moo's'tahfah) (1779-1808). Sultan of Turkey, placed on throne by the Janissaries who rebelled against Selim III in 1807.
Mustard. Plant having pungent seeds used as condiment and in medicine, 5-312.
Mustard Gas. The popular name for dichlorodithyl sulphide, a blistering chemical introduced by the Germans in the 1st World War.
Mustelidae, or weasel family. Long bodied carnivorous animals, such as weasels, minks, and skunks.
Mutations (in biology). See Sports.
Mutsuhito (mootsoohē'tō) (1867-1912), emperor of Japan, 4-349.
Mutton, joints of. 5-154 with illus.
Muybridge, Eadward (1830-1904). Brit. photographer; photography of moving objects, 2-389.
Muzaffar-ad-Din (moozaf'ar eddōn') (1863-1907). Shah of Persia; came

to throne in 1896; filled depleted treasury by loans; widespread discontent forced grant of liberal constitution (1906).
Muzzle-loading Gun, used on lightships 4-504.
M.V.D. Russian political police (initials of the ministry of interior). Force first formed, as Cheka, in 1917; renamed OGPU in 1922, later N.K.V.D., employs spies, informers, has right of summary arrest; 6-252.
Mwadui. Locality of Tanganyika, Africa, where a great deposit of diamonds was found in 1940.
Mycale (milk'alē). Mt. in anc. Ionia, Asia Minor, near which Greeks destroyed Persian fleet 479 B.C. Now known as Samsun Dagh.
Mycoellum. Network of hyphae which serves fungi as roots and shoots, 3-488.
Myconae (mī'cōnē). Anc. Gk. city in Argolis, 50 m. N.E. of Sparta, destroyed 5th cent. B.C. by Argos; early civilization, 1-21 25; remains, 4-73 illus.; Lion gate, 1-24 illus.
Myology. Science of fungi.
Mycoorrhiza. Partnership of a fungus and the root of a higher plant; bird's nest orchis, 5-444.
Myddelton, Sir Hugh (c. 1560-1631). Eng. contractor; made money in various commercial ventures; took over scheme for supplying city of London with water from Ware; New River opened 1613.
Myitkyina (mī'chīn'ah'). Tn. of Burma, 250 m. N.N.E. of Mandalay, on upper Irawadi, at limit of navigation; terminus of rly. from Mandalay; pop. 20,000. Scene of heavy fighting against Japs in 2nd World War

Myopia. Scientific term used to denote short sight.
Myosotis (species). See Forget-me-not.
Myriagram. A unit of weight in metric system (22-016 lb.).
Myriapoda. Class of many-legged animals, including centipedes and millipedes, 2-291, 4-261.
Myriol Alcohol, formula, 1-96.
Myrmidons. A warlike people of anc. Troy, led by Achilles in the Trojan War; term now used of lowly and unquestioning followers.
Myrobalan, or Cherry Plum, 6-228; in ink mfr., 4-262 illus.
Myron (5th cent. B.C.). Gk. sculptor; Discobolos, 4-84 illus.
Myrrh. A fragrant gum resin, used in perfumes and incense.
Myrtaceae. Family of trees and shrubs, including myrtles and cloves.
Myrtle. An evergreen shrub or tree, *Myrtus communis*, native of w. Asia and Mediterranean countries, brought to Eng. in 16th cent.; perfumes made from leaves and berries.
Mysore. State of Rep. of India, area 29,458 sq. m.; pop. 9,071,674; cap. Bangalore; 4-241.
Mystery Plays, in medieval drama, 3-117 with illus.
Mythology. The study of myths and legends, 5-312.
Mytilene. Anc. Lesbos. Gk. (formerly Turkish) isl. in Aegean Sea off coast of Asia Minor.
Myxoedema. Disease caused by lack of thyroid secretion, 4-28.
Myxomatosis. Fatal disease specific to rabbits, introduced into Australia from S. Amer. in 1950 for purpose of extermination. Appeared in Europe and Britain in 1953; 6-327.

N

THE series of little waves which formed the Egyptian sign called the "water line"  was the ancestor of our letter N. When written in running hand, the undulations tended to disappear and the character assumed the form  which looked more like a fish. The Phoenicians and Hebrews called it *nun*, the word for "fish" in their language, but they still further modified

it so that we might be inclined to say it looked more like a fish-hook than a fish . The early Greeks and Latins straightened the lines and, making them of more even length, evolved our N. The sound in English is made by bringing the end of the tongue in contact with the upper teeth, or gums, and sending the breath down through the nose while the vocal cords are vibrating

N.A.A.F.I. (Nazi). Navy Army. Air Force Institutes). Invn. catering for leisure hours of these services.
Na'bob. A term formerly used for anyone who, having made a fortune in the East, spent it ostentatiously at home.
Nabopolassar. King of Babylonia 625-605 B.C., founder of the Chaldean Empire; aided by Medes he captured Nineveh in 606 B.C.; father of Nebuchadnezzar; 1-335.
Naboth (nā'both). Owner of a vineyard coveted by Ahab, and obtained by Jezebel (through murderous fraud (I Kings xxi)).
Nacre, or Mother-of-Pearl; and substance of pearls, 6-102.
Nadir Shah (1688-1747). Ruler of Persia, 6-132; and Koh-i-noor, 3-84; and Paccok throne, 3-66.
Nadir Shah (1880-1933). King of Afghanistan, assassinated in 1933; 1-47.
Navius Gnaeus (c. 269-204 B.C.). Rom. poet; as translator of Gk drama, 4-449.
Nagasaki (nagōsah'ki), Japan. Spt on S.W. coast of Kyushu Isl.; pop. 235,000; exports; shipbuilding atom-bombed, 1-303, 7-498, 4-350
Nagoya. City and spt. of Japan on N. side of Honshu Isl.; industries include silk and cotton spinning, clock-making porcelain, and fans; pop. 1,336,779, 4-340.
Nagpur (nagpoor'), India. Cap. city of Madhya Pradesh, 450 m. N.E. of

Bombay; pop. 300,000. rly. centre cloth mfrs., manganese mines, 4-211.
Nahua. Language spoken by Aztecs and related peoples, 1-333.
Nahle. Tributary of r. Rhine, rises near Selbach, flows 60 m. to join Rhine at Bingen; 4-390.
Nahum (nā'hum) (7th cent. B.C.). Hebrew minor prophet; his book, the 14th of the Old Testament, foretells the doom of Nineveh, 1-338.
Naiads (nī'ads). In Gk. myth., water nymphs, 5-488.
Nails. Hardware, 5-312.
Nainsook. Soft muslin originally made in India. May be woven plain or with stripes. Sometimes made from silk.
Nairn. Co. tn. of Nairnshire, Scot.; pop. 1,700; 5-31.
Nairne, Carolina, Lady (1766-1845). Scot. poet, member of Jacobite family; wrote nearly 100 songs, 6-514.
Nairnshire. Co. of Scot.; area 163 sq. m.; pop. 8,719; co. tn. is Nairn; 5-314.
Nairobi (nī'rō'bi). City and cap. of Kenya Colony, Brit. E. Africa; pop. 130,000; centre for big-game expeditions; important trade centre 4-399 with illus.
Naismith, James (1861-1939). American inventor of basketball, 1-378.
Naja (species). See Cobra.
Najera, Spain; victory of Black Prince at (1367), 1-480.
Nakhon Rajasima. Tn. in Siam, formerly called Korat, 7-45.

Nakuru. Cap. of Rift Valley prov. Kenya, 4-400.
Names and their origins. 5-314; nick names, 5-133; and superstitions 5-78.
Nam Patene. Laos, Indo-China, in deposits at, 4-116.
Namur (namoor'), Belgium. Fortified industrial tn. 35 m. S.E. of Brussels at junction of Sambre and Meuse rivers; pop. 32,000.
Nana Sahib (nā'h'na sah'ēb) (c. 1821 c. 1860). Hindu prince, leader of Indian mutiny of 1857.
Nancy, France. Fortified city 175 m. E. of Paris; pop. 113,470 noted univ., 3-134.
Nanga Parbat. Mt. of Kashmir, 26,624 ft. German expeditions of 1931 and 1937 met with disaster trying to reach the summit; 4-176, climbed by Austro-German party 1953.
Nankeen Cloth, origin of name, 5-315
Nanking. City and formerly many times the cap. of China, on Yangtse; pop. 1,100,000; 5-315.
Nantes. Historic city and spt. of France; pop. 200,265; 5-316 3-438.
Nantes, Ediot (1598). Decree granting religious freedom to Fr. Huguenots; 3-450, 451, 4-202, 5-316.
Nanteuil (nāhtē'l), Robert (1630-78). Fr. portrait engraver, whose head

NANTUCKET

show masterly modelling and precise draughtsmanship; was one of the greatest engravers of all time.

Nantucket (nantuk'et) Island. Off S.E. coast of Mass., U.S.A.; near by is a famous lighthouse; tn. of Nantucket is a summer resort.

Nantwich. Tn. in Cheshire, Eng. Has tanning and clothing industries. Former centre of salt mining. Pop. 8,840.

Nan Uamh, Loch. Sea loch, Inverness-shire, Scot., 4-275.

Napaeada (nap'adz). In Gk. myth. nymphs of valleys.

Naphtha, as by product of gas infr., 3-507.

Naphthalene. A coal-tar product used in moth balls, 2-131; structure and formula, 2-319; model of organic molecule, 2-320.

Napier (nap'yer), Sir Charles James (1792-1853). Brit. soldier, fought in Sp. and France in Napoleonic wars; in 1841 in India commanded the army which conquered Sind, and for 6 years successfully governed the conquered territory.

Napier, John (1550-1617). Scot. mathematician, inventor of logarithms; his logarithm tables were first published in 1611, 5-17. Also invented "Napier's bones," a calculating machine that used bone rods for multiplying and adding.

Napier of Magdala, Robert Napier, 1st Baron (1810-90). Brit. soldier, took part in first and second Sikh wars, relief of Lucknow, and later Indian campaigns; commanded expeditions which stormed Peshwa forts in China in 1860, and Magdala, cap. of Abyssinia, in 1868, 1-7.

Napier. Port on E. coast of North Isl., New Zealand; pop. 20,300; wool and meat exports; a severe earthquake caused great damage in 1931.

Naples. Spl. of Italy; pop. 1,027,800, 5-317, 4-301, 7-395; in 2nd World War, 7-491.

Naples, Bay of. Inlet of Mediterranean in S.W. It., famous for scenery, 4-309.

Naples, Kingdom of, founded by Normans, 4-303; and House of Bourbon, 2-28; stamp, 7-143 illus.

Naples, University of. The largest univ. in It.; has over 12,000 students.

Napo (nap'oh). R. rising in Ecuador; flows 700 m. S.E. to Amazon.

Napoleon I (1769-1821). Emperor of the French, 5-318, 3-152; and army, 1-248; and Antwerp harbour, 1-178; at Alexandria, 1-102; overthrow of Directory, 3-169; use of Eau de Cologne, 3-156; and food preservation, 2-212; and Institute of France, 1-9; and Empress Josephine, 4-384; and Milan, 5-205; and Peninsular War, 6-116; overthrow of Spain, Inquisition (1808), 4-263; and sugar beet production, 7-184; and Talleyrand-Perigord, 7-220; at Waterloo, 7-123, 429. For military campaigns see also **Napoleonic Wars**.

Napoleon II. See **Reichstadt, Duke of**.

Napoleon III (1808-73). Emperor of the French, 5-323, 3-453; and Franco-Prussian War, 3-458; portraits, 1-398 illus., 5-324 illus.

Napoleon. Fr. gold coin, 4-43, 5-235 illus.

Napoleon, Louis (1778-1846). King of Holland 1806-10; brother of Napoleon I; father of Napoleon III, 1-517.

Napoleon Grande Melange. Variety of marble, 5-121 illus. f.

Napoleonic Wars (1796-1815), 5-318; and Germany, 4-8; Nelson and naval supremacy, 5-363; Peninsular War, 6-116.

Narba'da or Nerbudda. R. in India, rising in N. of Madhya Pradesh, flowing 750 m. to Gulf of Cambay; held sacred by Hindus.

Narbonne (nar'bon). Town in S. France, 5 m. from Mediterranean; pop. 26,000; coopering, distilling; early Rom. colony Narbo Martius.

Narcissus. Plant of the *Amoryllidaceae* family, 5-324.

Narcissus. In Gk. myth., 5-324; and Echo, 3-156.

Narcotine. Drug from opium, 5-521.

Narghile (nahr'gilā) or Hookah. Oriental tobacco pipe.

Narmer. Eg. king of First Dynasty (c. 3400-3200 B.C.), 3-184 illus.

Narragansett Bay, Rhode Island, U.S.A., harbours, 3-392.

Narrative Poetry, 6-235.

Narvik, Norway. Port in far N. on W. coast; pop. 6,750; rly. terminus, scene of successful British naval actions in 1940; 5-166.

Nar'whal. A cetacean, *Monodon monoceros*; remarkable for the long, single tusk projecting forwards from its head. At first there are two of these tusks (which are really teeth), but one of them fails to develop. The female has no tusks, 6-265, 4-331.

Naseby. Village in Northants, Eng.; battle (1645), 5-156, 2-307, 2-531.

Nash, John (1752-1835). Brit. architect, 5-324, 1-217, 218 illus.; Buckingham Palace, 2-101; Marble Arch, 5-26 illus.

Nash, John (Northcote) (b. 1893). Brit. artist; well known as painter of landscapes and for his wood engravings, 3-263.

Nash, Paul (1889-1946). Brit. artist, brother of above; official artist in France during 1st World War; stark, stylised landscapes, 3-263.

Nash, Richard (1671-1762). Brit. Society leader, popularly called "Beau" Nash; he made Bath a resort of fashion, 1-383.

Nashe, Thomas (1587-c. 1601). Eng. writer and playwright; wrote many pamphlets; *The Unfortunate Traveller* is an early Eng. novel; 3-285.

Na Sheallag, Loch, Ross and Cromarty, Scot., 6-155.

Nashville, Tennessee, U.S.A. State cap. on Cumberland r.; pop. 173,350; educational centre; important livestock and wheat-grinding market; wood, cotton, tobacco; 7-256.

Nassau (nas'ow). Cap. and spl. of Bahamas; pop. 12,975; on New Providence Isl. (pop. 25,391); 1-317.

Nassau, Germany. Since 1946 part of Land of Hesse.

Nasser, Colonel Gamal Abdel (b. 1918). Egyptian president, elected 1956; premier 1954; head of state 1953; 3-182; and Suez canal, 7-182.

Nasturtium. Plant, 5-324; pollen grain, 3-399 illus.; transpiration, 4-170; watercress, 7-127.

Natal. Prov. of the Union of S. Africa; area 35,284 sq. m.; pop. 2,408,000, of whom 274,500 are Europeans; state cap. is Pietermaritzburg; 5-325, 7-88, 2-81; citrus plantation, 7-95 illus.; Drukenburg mts., 1-61 illus.; Zululand, 7-527, 7-89 illus. f.

Na'than. Hebrew prophet; rebuked David for treachery to Uriah (2 Samuel vii. xii).

National Anthems, 5-325.

National Assembly. Parliament of Fr.; in Fr. Revolution, 3-167, 168, 5-13; and metric system, 5-181.

National Book League. Educat. soc. representing authors, publishers, booksellers, librarians, and readers.

National Central Library. Founded 1916 as Central Library for Students; buildings in Malet Place, London; services of, 4-187.

National Coal Board. The Coal Industry Nationalisation Act came into force on Jan. 1, 1947, when Brit. mines were taken over by the govt. The National Coal Board was formed to direct the industry.

National Gallery, London, 5-327, 5-21 illus. f., 7-229; Angerstein collection, 2-454.

National Government. Formed in Gt. Brit. in 1931, with Ramsay MacDonald as premier, to deal with financial emergency, Cabinet of representatives of Conservatives, Liberal, and National Labour parties. After 1935 elections this National Govt. became so predominantly Conservative that it was national in name only. The second great National Govt. was the war-time ministry of all parties 1940-45 headed by Winston Churchill.

NAVAJOS

National Grid on Ordnance Survey maps, 5-119, 120 illus. f.; and system of electrical power, 3-210, 218. See also **Grid**.

National Guard. Body of citizens organized in Paris at the outbreak of the French Revolution, 1789; Lafayette and, 4-137.

National Health Service. Service introduced 1948, under which all U.K. residents became entitled to free medical, surgical, dental, and optical attention and hospital treatment. Medicines and appliances were also free until 1951, when charges for spectacles and dentures were introduced; further charges for prescriptions, hearing aids, wigs, etc., and for dental treatment (up to £1) were added 1952.

National Hunt Committee. Ruling body of steeplechasing, 4-199.

National Institute for the Blind, 1-488; gramophone library, 4-187.

National Insurance. Compulsory scheme of insurance in U.K., 4-271; pensions, 6-120.

National Library for the Blind, 4-187.

National Maritime Museum, Greenwich. Established in 1931; 5-300.

National Parks. Regions of great natural beauty, protected by the governments of Canada and U.S.A., 2-196 illus. f., 7-513. Gt. Britain began designation of national parks in 1919; 3-257, 9-331, 7-78.

National Physical Laboratory (N.P.L.), Teddington. Govt. dept. for testing materials and standards; metallurgy division, 5-177; scale models for scientific testing, 5-229, 230 illus.

National Playing Fields Association. Founded in 1925, 6-185.

National Portrait Gallery, London, 5-328, 5-27.

National Service. Form of conscription in Gt. Britain, 1-218.

National Socialism (Nazism, Germany), 5-328, 4-10, 4-181, 53, 7-185.

National Society for the Prevention of Cruelty to Children, 2-553.

National Trust for Places of Historic Interest or Natural Beauty, 5-330, 3-257.

Nations, Battle of the (1813), defeat of Napoleon, 5-323.

Natural. See **Musical Terms** (list).

Natural Gas, 5-331; 3-487; 6-150.

Natural History. The study of plants, animals, and the outdoor world. See also **Birds**; **Botany**; **Insects**; **Nature Study**; **Plant Life**; **Trees**; **Zoology**.

Natural History Museum, South Kensington, London. A branch of the Brit. Museum; moved from Bloomsbury in 1880; 5-27, 5-300 illus.

"Natural" Logarithms, 5-18.

Natural Scale. See **Musical Terms** (list).

Natural Selection, Darwin's theory, 3-51, 1-155, 156.

Nature Study, 5-332; plant life, 6-244; zoology, 7-526.

Naucratis. Prosperous Gk. colony in 6th cent. B.C. on Nile delta, Egypt, 50 m. S.E. of Alexandria.

Nauru Island. Small coral Isl. in Pacific, just S. of Equator; 8 sq. m.; pop. 3,431; admin. by Australia, N.Z., and Brit. under U.N. trusteeship; large trade in phosphates.

Nausicaa. In the *Odyssey*, daughter of King Alcinous; and Odysseus, 5-503.

Nautical Almanac. Work of reference for seamen, 1-117; and navigation, 5-338.

Nautical Mile, 5-338.

Nautical Terms. See list in next page.

Nautilus (naw'tilus). Capt. Nemo's submarine in Jules Verne's *Twenty Thousand Leagues Under the Sea*, 7-393; name of submarine used by Sir Hubert Wilkins to travel under Arctic ice, 6-245; also of U.S. submarine, launched 1951, first atomic-powered vessel, 7-177.

Nautilus, Pearly. A primitive mollusc, sole survivor of group *Nautiloidea*; 5-232.

Navajos. Amer. Indians living in Arizona and New Mexico, U.S.A., 6-375, 6-400; handieruffs, 1-238.

Naval Architect, career as, 2-238.
Naval Mines, various types of, 5-219.
Navas or An Usamah. Tn. of co. Meath, Leinster prov., Irish Rep.; pop. 4,273.
Navarino [navahr'no]. Battle of (1827). In which Fr., Rus., and Brit. fleets, in defence of Greece, defeated Turks in Bay of Navarino on s.w. coast of Greece, 4-78.
Navarre. Medieval kingdom of w. Pyrenees, now divided between Fr. and prov. of Navarra in Sp.; Henry IV of Fr., King, 4-184.
Nave. See Architectural Terms (list).
Navicert. War-time permit issued by blockading powers allowing lawful cargoes bound for, and coming from, neutral ports, to pass through contraband control areas; instituted by Brit. in 1915, and again in 1939.

Navigating Officer, in Merchant Navy, 5-172.
Navigation, 5-338; acetylene lights, 1-10; and astronomy, 1-285; buoy, 2-128; chronometry, 2-383; compass, 2-474, 4-113; lighthouses, 4-602; magnetic compass, 5-83; by radar, 6-358, 336 diag.; ship's log, 5-14. See also Navy; Ships.
Navigation Acts. Laws which greatly increased Brit. shipping trade; Cromwell's Navigation Act, 1651, not first but most important; no goods might enter Eng. ports unless in Eng. ships or ships of the country the goods came from (i.e. aimed against Dutch carrying trade), while Eng. goods must be exported in Eng. ships; Eng. colonies, including America, were forbidden,

1660 and 1663, to trade in any but Eng. ships; all repealed in 1849.
Navigational Charts, 5-338; 5-341.
Navigator's Islands. See Samoa.
Navy, 5-342; admiral, 1-20; Alfred the Great founds, 1-104; Athenian, 1-288; in battle of Atlantic, 1-293; battleships, 5-342, 343; beards, 1-397; cadets, 2-159; camouflage, 2-191 illus.; as a career, 5-172, 5-355, 2-240; Chatham docks, 3-309; convoys in 2nd World War, 7-490, 488 illus.; guns, 5-353; insignia of Royal Navy, 5-354 illus.; International Signal Code, 7-52 illus. f.; press gangs, 6-285; radio installed in ships, 6-343; supremacy in Seven Years' War, 7-2; ships and ship-building, 7-28; submarines, 7-174, 5-349, 7-481, 482; torpedo, 7-291.

A LIST OF IMPORTANT NAUTICAL TERMS

A.B. Able-bodied seaman.
Abeam. Term used when a square-rigged sailing ship has the wind on the fore side of the sails.
Ahead. Towards the stern.
Accommodation Ladder. Steps lowered over the side of a ship.
Aft. Near the stern.
Aftership. Central or midship section of a ship.
Anchor. Heavy metal implement lowered to the sea or river bed on a chain to hold a ship stationary.
Auxiliary. Vessel having both sails and engine.
Ballast. Material, generally water, placed inside a ship to keep her upright.
Beam. Width of a ship, and a girder supporting the decks.
Bearing. Compass direction to denote position of an object in relation to a vessel.
Bligs. Flattest part of the bottom of a ship.
Binnacle. Stand supporting the compass.
Block. Iron or wooden casing containing one or more sheaves, or wheels, through which ropes are passed for hoisting sails, etc.
Bollards. Stout short posts round which mooring ropes, etc., are twisted.
Boom. Spar used for extending a sail, or lifting cargo.
Bow. The forward part of a vessel.
Bowsprit. Spar projecting over the bow.
Boxing the Compass. Repeating the 32 points of the compass in proper order.
Break. Change of level in a deck.
Bridge. Narrow raised platform built across a ship for navigational purposes.
Bulkhead. Vertical partition inside a ship.
Bulwark. Raised side of ship, usually topped by rails.
Bunk. Fixed bed.
Bunker. Compartment for carrying a ship's fuel.
Buoy. Floating object anchored to the bottom to mark a channel or obstruction, or for use as a mooring.
Cable. Stout rope or chain, generally attached to an anchor.
Capstan. Vertical revolving machine used for lifting the anchor, or hauling in heavy ropes.
Carvel-built. Description of boat built with planking placed edge to edge.
Ceiling. Inside planking or plating of a ship.
Centre-board. Extra keel in a sailing-boat, which can be lowered or raised.
Clew. Piece of metal or wood with arms, around which a rope can be twisted.
Clew. Lower corners of a square sail, and the after corner of a fore-and-aft sail.
Clinker-built. Description of boat built with the planks overlapping.
Cooming. Low parapet round an opening in the deck.
Companionway. Internal staircase or ladder in a ship.
Compass. Navigational instrument with a revolving marked card, and a

magnetic needle which points to the Magnetic Poles.
Counter. Overhanging stern.
Davits. Cranes found a ship's sides for lowering and hoisting life-boats.
Deadeye. Hardwood disc with three holes, used in pairs for tightening the shrouds.
Dead Reckoning. Method of calculating a ship's position at sea by log and compass, without astronomical observations.
Derriek. Room used for handling cargo.
Dinghy. Small sailing or rowing boat, sometimes fitted with an outboard engine.
Drifter. Fishing vessel, which drifts its nets and does not pull them.
Ensign. National flag of a ship.
Fathom. Nautical measure of 6 feet.
Fore. At or towards the bow.
Fore-and-Aft. Anything placed lengthways in a ship, including sails.
Freeboard. Side of a vessel between the water-line and the main deck.
Galley. Ship's kitchen.
Gangway. Opening in a ship's bulwark-used for entering or leaving a ship.
Gunwale. The upper edge of a boat's side, in a rowing-boat that part of the side in which the rowlocks are fixed.
Hatch. Opening in the deck, usually for cargo.
Hawse Pipe. Holes in the bow of a ship through which the anchor cable passes.
Hawser. Thick rope used for towing, etc.
Heave-to. To stop a ship's movement through the water without anchoring.
Heel. To lean over to one side.
Helm. Steering gear of a ship.
Hold. Spaces below deck for cargo.
House-flag. Flag flown to indicate the ownership of a vessel.
Jackstaff. Small flagstaff in the bow.
Jury. Anything temporary, such as a jury mast.
Keel. The steel backbone of a ship running from stern to stern.
Lead. Heavy metal sinker placed on a line.
Leeward. Opposite side to that from which the wind is blowing.
Leeway. Sideways movement induced by pressure of wind or sea.
Load Line. Lines and symbols marked on a ship's side indicating the maximum depths to which the vessel may be loaded.
Log. Instrument for indicating the speed of a ship through the water; also the ship's official diary.
Marline. Thin two-strand rope, usually tarred.
Marline Spike. Pointed pin used for separating strands of rope in splicing.
Moor. To make a vessel fast to a buoy or pier.
Navigation Lights. Lights shown at night by a ship under way; red on port side, green on starboard, white at the masthead.
Pendant. Triangular flag (pronounced "pennant").
Pitching. Ship's up-and-down motion from bow to stern.

Poop. Raised deck right aft, totally enclosed.
Pooped, To BE. To have a big wave come aboard over the stern.
Port. Left-hand side looking forward.
Quarters. Sides of a ship's stern, also accommodation.
Rake. Slope of masts, funnels, or bow.
Ridelines. Small ropes fastened between the shrouds to make a ladder.
Reef (verb). Partly to furl a sail by taking in reefs, using short pieces of rope called reef points.
Riding-light. White light or lights hoisted to indicate a ship at anchor or moored.
Rolling. Motion of a ship from side to side.
Running Rigging. Ropes which hoist, lower, move, or secure the sails.
Salvage. Saving a ship in difficulties or wrecked; or the cargo saved.
Soupper. Hole or gutter bordering a deck for draining off water.
Shackle. Fitting, generally U-shaped with a pin, to join lengths of chain, or attach other fittings.
Sheets. Ropes which secure the lower corners of sails, or alter their position in relation to the wind. *Never* a sail.
Shrouds. Ropes or wires holding the masts, etc., steady, and secured to the sides of the ship and masthead.
Sidelights. Circular windows in the side of a ship, portholes to land-men. Also called scuttles.
Spar. Mast, yards, bowsprit, etc., of a sailing ship.
Stanchion. Vertical bar supporting rail, awning, etc.
Standing Rigging. Ropes in a ship which are not movable, such as shrouds and stays.
Starboard. Right-hand side looking forward.
Stern. The after part of a vessel.
Staysail. A triangular sail set on one of the stays supporting the mast.
Strake. Continuous line of planking or plating extending from bow to stern.
Tacking. Moving as nearly as possible against the wind by a series of zig-zags.
Taffrail. Rail round a ship's stern.
Thwarts. Seats placed across an open boat.
Tramp. Ship that makes voyages from one port to another, carrying such casual cargo as can be obtained.
Trawler. Fishing vessel which drags its nets along the sea bed.
Under Way. Description of a ship in motion.
Veer. To pay out a rope or cable.
Warping. Moving from one berth to another by hauling on ropes.
Watches. Four-hour periods into which the day is divided aboard ship, but a dog watch is of only two hours' duration. The crew is also divided into watches. The spell of rest is the "watch below."
Windlass. Form of horizontal capstan.
Yard. Slender spar set crosswise on a mast, and from which a sail is suspended.

NAXOS

Naxos [nak'sos]. Gk. Aegean isl., largest of Cyclades; 163 sq. m.; pop. 18,000; ravaged by Persians 490 B.C.; seat of Venetian dukes (1307); captured by Turks (1566).
Nayarit [nahyah-rēt]. Mexico. State on cent.-w. coast; 10,000 sq. m.; pop. 216,690; cap. Tepic. Products sugar, tobacco, gold, silver, lead.
Nazareth. Tn. in state of Israel 65 m. N. of Jerusalem; pop. 10,000; the home of Jesus Christ, 5-369.
Naze. A headland on the E. coast of Essex, 5 m. S. of Harwich; Naze means nose or promontory.
Nazi. Ger. political party, 5-359, 4-10, and the term Aryan, 1-262; Hitler and the rise of Germany, 4-181, 7-485; h.q. at Munich, 5-296; swastika, 2-535. *See also* Germany; Hitler; National-Socialism.
Nazimuddin, Khwaja (b. 1894). Pakistani statesman; gov. gen. of Pakistan (1948-51); prime min. of Pakistan (1951-53).
Ndola. Tn. in N. Rhodesia; pop. 60,000; mines, 6-394.
Neagh, Lough [lokh nā]. Lake in N.E. Ireland, near Belfast, largest in Brit. isls.; 1-178, 4-281, 5-31.
Neanderthal Man. Race of Stone Age beings; not direct ancestors of modern Man 5-105, 106 illus.
Neapolis [népah'ōl]. Anc. Gk. settlement on site of Naples.
Neap Tides. 7-275 with illus.; Sun and, 4-67.
Near East. Name applied to area including Egypt, Persia, Iraq, Palestine, Arabia, Turkey, and Syria.
Neath, Wales. Tn. in Glamorganshire, 8 m. N.E. of Swansea; in important mining dist.; copper smelting. tinplate works; pop. 32,304.
Neb'neb. An African assalia, 1-8.
Ne'bo. A mt. in Palestine whence Moses saw the Promised Land; perhaps the modern Jebel Neba (2,630 ft.) near N. end of Dead Sea.
Nebraska. State of U.S.A.; area 77,337 sq. m.; pop. 1,323,510; cap. Lincoln, 5-359.
Nebuchadnezzar or **Nebuhadrezzar**. Babylonian king 604-561 B.C.; and Babylon, 1-335, 5-176; and Daniel, 3-40, 6-298; hanging gardens of Babylon, 7-1; captivity of Jews, 1-339; captured Jerusalem, 4-375.
Nebulae, in astronomy, 5-360; types of, 1-284; cone, 1-283 illus.; spiral, 1-282 illus.
Neb'ular Hypothesis. Theory that solar system condensed from a nebula, 6-213.
Neck'ar, Ger. Tributary of Rhine rising in Black Mts., entering main stream at Mannheim, 4-157, 6-390.
Neck'er, Jacques (1732-1804). Fr. financier; father of Mme. de Staël; director-general of Fr. finances, 5-43, 3-466.
Necklace. Article of jewelry; origin, 4-372 with illus.
Neurosis or **Phosy Jaw**. A bone-wasting disease caused by handling phosphorus; once common among workers in match factories, 5-147.
Nectar. Sweet liquid yielded by flowers; as ant food, 1-162; and bumble-bees, 1-407; and pollination by insects, 3-400; gathered by worker bees, 1-405.
Neot'arine. A fruit, smooth-skinned like the peach; so tender of skin that it must not be touched by hand whilst growing, 6-100.
Nedjed. *See* Nejd.
Needle Appliqué, type of lace, 4-430 illus.
Needle-gun, 3-358 illus.
Needle-point Lace, examples of, 4-430 illus.
Needlerun Embroidery Lace, how made, 4-433.
Needles, 5-361; gramophone needle, 4-58.
Needles, The. A group of chalk rocks off the W. end of the Isle of Wight; the Needles lighthouse is 109 ft. high, and stands on the westernmost rock; the name comes from a single pillar of chalk, 130 ft. high, which fell in 1764; 7-450 illus.

Needlework, embroidery, 3-237; sewing, 7-6.
Neerwinden [né'r-vinden]. Belgium. Village 30 m. E. of Brussels where French defeated English in 1693, and Austrians defeated French in 1793, 3-469.
Nefertiti. Wife of Eg. Pharaoh Akhnaton; limestone head, 3-203 illus.
Nefud. Desert of Central Arabia; area of deep sand extending 400 m. from E. to W. and 200 m. wide. Average altitude 3,000 ft., 1-190, 3-78.
Negapatam [negapatam']. Port of Madras, Rep. of India; pop. 48,000; trade with Ceylon and E. Indies; point for coolie emigration; vegetable oils; exports rice.
Negative. A qualifying term applied to one of two points between which an electric current exists, to distinguish that one which corresponds, as far as the tendency to set up a current in an external circuit is concerned, to the zinc plate of a Daniell cell. Of cell, 1-386; as type of electricity, 3-211, 212, 5-82.
Negative, in photography; developing, 6-181.
Negriforms. A racial division of the peoples of mankind; characteristics, 6-333, 335 illus.
Negri Sembilan. State of the Federation of Malaya; area 2,580 sq. m.; pop. 267,668, 5-94.
Negritos. Small, black, pygmy people; in New Guinea, 5-398; in Asia, 6-312; in Philippines, 6-156.
Negro, 5-362, 1-50; children, 2-343, 346 illus.; in Arkansas, 1-239; banjo, 1-361; in Brazil, 2-47; hair, 4-118; in Jamaica, 4-337; and jazz music, 4-357; in Louisiana, 5-44; in New York city, 5-414; slave trade, 7-65.
Negro R., tributary of the Amazon, 7-371, 1-129.
Negro Ant, *Formica fusca*, in Britain, 1-163.
Negro Mt. Poun., U.S.A., 3,213 ft., highest point in state, 6-119.
Negros [nā'grōs]. Fourth largest isl. of Philippines; 4,900 sq. m.
Neguib, Gen. Mohamed (b. 1901). Eg. soldier and politician, 3-180.
Negus. Abyssinian title "King"; origin, 1-6.
Nehemiah [néhem'ia] (5th cent. B.C.) Gov. of Judea under Artaxerxes; restored walls of Jerusalem, relieved condition of poor, 4-375.
Nehemiah, Book of. Book of Old Testament largely written by Nehemiah; recounts events of his rule.
Nehru, Jawaharlal (b. 1889). Indian statesman, 5-362, 4-253 illus.
Nejd or **Nedjed**. Desert region in cent. Arabia part of Kingdom of Saudi Arabia; 1-190.
Nelson, Horatio Nelson, Viscount (1758-1805). Brit. sailor 5-363; portrait, 5-365 illus.; and Collingwood, 2-454; battle of Copenhagen, 2-501; at Trafalgar, 7-304, 305 illus.
Nelson, British Columbia. City in S.E. on arm of L. Kootenay; pop. 5,750; commercial centre of the mining, lumbering, and fruit-growing Kootenay dist.
Nelson River, Canada. Name given to lower course of Saskatchewan in Manitoba; flows 400 m. N.E. from L. Winnipeg to Hudson Bay; 5-114, 4-200.
Nelson's Column, London. Memorial erected in centre of Trafalgar Square by public subscription 36 years after Nelson's death; built of granite, 200 ft. in height, Corinthian in style, with capital of gunmetal; surmounted by statue of Nelson; bronze low-reliefs on pedestal of metal from captured French guns; lions modelled by Sir Edwin Landseer, 5-31 illus., 6-173 illus.
Nematoda, non-segmented worms; in zoological classification, 1-154.
Nemean Lion, in Gk. myth., Hercules and, 4-166.
Nemesis. In Gk. myth., daughter of Night and a deity of the underworld; goddess of vengeance.

NETHERLANDS

Nemi. Lake of cent. Italy, in crater of an extinct volcano, in Alban Hills, 20 m. S.E. of Rome; and Golden Bough legend, 3-461.
Nene or **Nen**. R. of Northamptonshire, Eng., flowing into the Wash; 90 m. long; 5-456.
Neodymium (Nd). Chem. element; atomic no. 60; atomic weight 144.27; 3-224.
Neolithic Age or **New Stone Age**, 7-163, 5-108; emergence of agriculture, 1-71; flint implements, 3-389 with illus.; pottery, 5-109.
Neon (Ne). An element of the inert gas group; atomic no. 10; atomic weight 20.183; 5-366, 3-224; in air, 1-80, 81; discovered by Ramsay, 6-363; as method of "cold" lighting, 4-501.
Nepal (népaw'). Kingdom between N.E. India and Tibet, among the Himalayas; area 54,000 sq. m.; pop. (est.) 5,600,000; 5-366; (Lurkha) people, 4-107.
Nepales Rupee. *See* Money (list).
Nepheocystis. Brown seaweed found in N. Pacific, 1-104.
Nephrite, a type of jade, also known as New Zealand jade, 4-336.
Neptune. In Rom. myth., sea-god, corresponding to Gk. Poseidon, 5-367, 7-522.
Neptune. Planet, 5-367, 6-213; atmosphere of, 1-82; orbit, 6-229 illus.; in solar system, 1-282, 278 diag.
Neptunium (Np). Chem. element, artificially produced and does not occur in Nature; atomic no. 93; atomic weight 237; 3-224.
Nerbudda. *See* Nerbada.
Nereids. In Gk. myth., sea nymphs of the Mediterranean, 4-488.
Nereus [né're'us]. In Gk. myth., a minor sea-god, father of the Nereids; sometimes called "the old man of the sea"; he guided Hercules to the garden of the Hesperides after changing himself in turn to fire, water, snake, and other forms in effort to escape from Hercules.
Nero (A.D. 37-68). Emperor of Rome, 5-367, 2-379, 6-137, 7-126.
Nerva (A.D. 32-98). Rom. emperor, kindly but feeble; adopted Trajan as colleague and successor, 6-439.
Nerve Poisons, types of, 6-236.
Nerves. In anatomy, 5-368; in brain, 2-40; psychiatry, 6-299.
Nesbit, Edith (1858-1924). Brit. poet, novelist, and author of children's books including *Fire Children* and *Il*, and *The Wombles*; 2-356.
Ness, Loch. Lake in Scotland; 23 m. long, average width one mile; discharges into Moray Firth by R. Ness, 8 m. long; at various times, esp. in 1833-34, it was said to harbour a monster of strange shape and enormous size; 4-275, 6-510, 511.
Nessus. In Gk. myth., a centaur slain by Hercules; shirt of, 4-160.
Nestor. In the *Iliad*, wise old warrior and counsellor of Greeks in the Trojan War. The "Nestor" of an organization or group means the oldest and most experienced member.
Nestorians. Christian sect named after Nestorius (d. about 440), patriarch of Constantinople; centred in Persia; "catholicon" or chief bishop had seat at Baghdad from 762 to 1258; in 6th and 7th centuries spread over much of Asia, evangelising India and China, adherents now number about 150,000 in Turkey and Persia.
Net, material; as foundation of lace, 4-433.
Net, fishing; 3-376 illus.; used by trawlers, 3-380, 378 illus.
Netball. A game, 5-369.
Netherlands, Kingdom of the, in N.W. Europe; area 13,550 sq. m.; pop. 10,250,000; 5-350; Amsterdam, commercial cap., 1-141; Utrecht, 7-372; flag, 3-384 illus. f.; physical features, 5-377; industry and trade, 5-378, 380; fisheries, 3-380; costume, 2-349 illus.; duck decoys, 2-132; golf, 4-44; stamp, 7-143.
History: 5-380, 3-314; Philip II's rule, 6-155; Dutch East India Co., 1-136, 1-370; settlements in N. Amer., 5-421; Charles V and

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William of Orange, 7-454; Ceylon under Dutch rule, 2-207; War of Amer. Independence, 1-139; rule in Java, 4-355; in 2nd World War 7-495, 7-486.

Netherlands, Art of (Dutch and Flemish Schools), 5-381; compared with Eng. art, 3-258.

Netherlands Antilles. Group of isls. in W. Indies, including Curaçao, Aruba, and four smaller isls.; area 380 sq. m.; pop. 164,073; 5-370.

Netherlands East Indies. Given independence by the Netherlands in 1949; became in 1950 the Rep. of Indonesia, 4-357.

Netherlands Guiana. See Surinam.

Netherlands New Guinea. Territory in New Guinea, occupying one third of the island; cap. Hollandia; area approx. 150,000 sq. m.; pop. 1,000,000; 5-370, 5-390.

Net-making. development of lace, 4-129.

Netuke. Small, carved, wooden or ivory figure used to fasten cord on man's sash; as Jap. work of art, 4-351.

Nettle. A herb with hairs which exude a stinging juice when broken, 5-393.

Neuchâtel (névshâtel'). Educational centre in w. Switzerland on L. Neuchâtel; precision instruments; mechanical knitting; viticulture; pop. 23,800. See also La Tène.

Neuchâtel. Lake in w. Switzerland, 18 m. N. of L. Geneva; 924 sq. m.; 7-211; fogs, 3-405.

Neuilly (névô) or Neuilly-sur-Seine, Fr. mfg. and residential tn. and N.W. suburb of Paris; pop. 60,170.

Neumes. System of signs to indicate musical sounds used in early church music, 5-303.

Neurath (nôl'raht), Baron Constantin von (b. 1873). Ger. statesman. Ambassador in London (1930-32); min. for foreign affairs (1932-38). Reich Protector of Bohemia and Moravia, 1939-41. Tried for war criminal.

Nuremberg 1945-46; sentenced to 15 years but released 1951.

Neurology 'nmedicine, 5-165; human nervous system, 2-40, 12, 5-368-69.

Neuroptera (zool.). Order of insects; in classification of insects, 4-270.

Neurosis. Freud's work on, 3-470; types of, 6-299-300.

Neurosurgery. of brain, spinal cord, and nerves, 7-195.

Neutral. Conductor or electrical circuit in which no current flows.

Neutral. Position of gear lever in motor vehicle, 5-282.

Neutral Axis. in stresses on beams, 2-61 with diag.

Neutron. Sub-atomic particle carrying no electric charge. It has a slightly greater mass than the proton (*q.v.*) and is a constituent of all atomic nuclei, except the hydrogen nucleus, which is a single proton. Because of its lack of electric charge, the neutron can pass readily through matter. In atomic nucleus, 1-298; in nuclear fission, 1-300; in transmutation of elements, 6-352.

Neuve-Chapelle (névshapel'). Fr. vil. 25 m. S. of Ypres; 1915 battle.

Neva. R. of N.W. Russia, flows 40 m. from Lake Ladoga to Gulf of Finland 10 m. below Leningrad; Leningrad on, 4-479.

Nevada. State of U.S.A.; area 110,540 sq. m.; pop. 160,083; cap. Carson City; 5-393.

New'ern, Wales. R. of Pembrokeshire, entering Cardigan Bay close to Newport, 10 m. long.

Neville. Great Eng. family; the most famous member was Warwick "the Kingmaker" (Richard Neville). See Warwick, Richard Neville, Earl of.

Neville's Cross. Durham, Eng.; battle (1346), 3-140.

Nevinson, Christopher Richard Wynne (1889-1946). Brit. artist; famous for expressionistic work as official artist in 1st World War.

Nevinson, Henry Woodd (1857-1911). Brit. writer, father of C. R. W. Nevinson; famous special correspondent, and champion of many reform movements.

Nevis, Ben. See Ben Nevis.

Nevis, Loch. Sea loch, Inverness-shire, Scot., 4-275.

Nevison, Swift Nick (John) (1639-84). Eng. highwayman; "ride to York" story, 4-176.

Nevsky Prospekt. Famous thoroughfare in Leningrad, later renamed October 25 Prospekt, 4-479.

New Amsterdam. Name given to New York City when it was a Dutch settlement, 5-116, 421.

Newark (nû'ark), or Newark-on-Trent. Old tn. in Nottinghamshire, 65 m. S.E. of Manchester; pop. 22,909; once fortress of great strength and called "key to North"; here Charles I was besieged in 1616 by the Scots, to whom he finally surrendered; 5-468; castle, 2-258 illus.

Newark, New Jersey, U.S.A. Largest city of state; pop. 137,857; chief jewelry mfg. centre in the country, and has important leather, button, and hat industries; an airport for New York City; 5-398.

New Bedford, Massachusetts, U.S.A. Mfg. city on Buzzards Bay; pop. 109,189; for long the chief whaling port in the world, and now the principal cotton-yarn and cloth centre in the U.S.A.; 5-145.

Newbolt, Sir Henry John (1862-1938). British writer. Works include: "Admiral" "All" and "Drake's Drum" (verse); *The Old Country* (novel); official naval historian of 1st World War.

New Britain. Largest isl. in Bismarck Archipelago, part of Australian New Guinea; about 10,000 sq. m.; native pop. 40,350; formerly the Ger. isl. of New Pomerania; 6-26.

New Brunswick. Maritime prov. of Canada; area 27,985 sq. m.; pop. 515,097; cap. Fredericton; 5-393.

Newbury. Market tn. in Berkshire on Kennet and Avon Canal; race-horse training; agric. trade; pop. 17,772; two battles were fought here in Civil War (1643, 1644), 1-132.

New Caledonia. Fr. isl. 850 m. E. of Queensland, Australia; 8,500 sq. m.; pop. 61,250. Mountainous with little fertile soil; 6-26; nickel mined, 6-29.

New Castle. The S. part of Castle, including old Moorish kingdom of Toledo; chief cities Madrid, Toledo, Ciudad Real; fertile river valleys, sterile high plateaux.

Newcastle. Tn. in N.S.W., Australia; pop. 131,580; on largest known coalfield in Australia; 5-492.

Newcastle-under-Lyme. Tn. in Staff., Eng., 30 m. S. of Manchester; pop. 70,028; important potteries and collieries in neighbourhood; mfrs. chemicals.

Newcastle-upon-Tyne. Great coal shipping centre of Northumberland, Eng.; pop. 291,723; 5-394; coal-mining charter, 2-129; Hadrian's Wall, 3-219; univ., 5-140.

New Church. Religious denomination which accepts and promulgates the doctrines and claims of Emanuel Swedenborg, 3-161, 7-204.

Newchwang (nûchwang) or Niuchwang. Also called Yingkow; port of Manchuria, 300 m. S.E. of Peking; pop. 82,000.

New College, Oxford Univ.; foundation, 6-17.

New Comedy. In Gk. drama, 3-116.

Newcomen, Thomas (1683-1729). Eng. mechanic; first practical steam pumping engine, 7-152; Watt's improvement on, 4-260.

New Deal. Programmes of legislation initiated by Pres. F. D. Roosevelt in 1932 to promote U.S. social recovery.

Newdigate, Sir Roger (1719-1806). Brit. politician and antiquary; donor of the Oxford Univ. poetry prize bearing his name.

Newel-Post. See Architectural Terms.

New England. Collective name for states of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Isl., U.S.A.; 5-144. See also separate states and cities.

New English Art Club. Formed 1886, strongly influenced by French paint-

ing; Slade School teaching reflected it, 3-282.

New English Dictionary. See Oxford English Dictionary.

New Forest. Wooded region in S.W. Hampshire, Eng., 4-123, 3-248, 7-152 illus.

Newfoundland. Isl. in Gulf of St. Lawrence; a prov. of Canada; area 42,734 sq. m.; pop. 361,416; 5-394, 2-82; discovery, 1-134; fishing grounds, 2-199, 3-390; and Breton fishermen, 1-136; Labrador, 4-428; sea fogs, 3-405.

Newfoundland Banks or Grand Bank. Submarine plateaux off coast of Newfoundland, famous fishing ground, 5-395.

Newfoundland Dog. Breed of dog introduced into Gt. Brit. from Newfoundland in 18th cent., 3-100 illus. 1.

New France. Name for Canada, when under French rule, 2-199-200.

Newgate. Prison in London, built about 1200, several times rebuilt and remodelled and finally demolished in 1903, making room for the Central Criminal Court ("Old Bailey"). Until 1868 public executions took place outside Newgate, and vast crowds assembled to see them; 6-291; Elizabeth Fry and, 3-495.

New Granada. Sp. colony in S. America, later named Colombia, 2-159.

New Guinea. Largest isl. of Malay archipelago, now three territories:

1. Australian territory of Papua, 2. North Eastern New Guinea, admin. by Australia; 3. Netherlands New Guinea; pop. est. 2,000,000; area 300,000 sq. m., 5-395, 1-319; in 2nd World War, 7-191.

New Hall. Women's college of Cambridge Univ., 2-182.

New Hampshire. State of the U.S.A.; area 9,304 sq. m.; pop. 533,242; cap. Concord; 5-397.

New Haven, Connecticut, U.S.A. Chief city of state, seat of Yale Univ.; pop. 163,350; distributing centre for coal, cement, lumber; mfrs. fire arms, clocks, hardware.

Newhaven. Spl. on Eng. Channel in Brighton; ferry point for Dieppe.

New Hebrides. Group of isls. E. of S. Australia, under joint control of Britain and France; 5,700 sq. m. pop. (est.) 41,000; export coffee, copra, cotton, 6-26; stamp, 6-30 illus.

New Holland. Former name of Australia.

New Ireland. Second largest isl. of Bismarck Archipelago; 4,600 sq. m.; 6-26.

New Jersey. State of U.S.A.; area 7,836 sq. m.; pop. 1,835,529; cap. Trenton; 5-398.

Newman, John Henry, Cardinal (1801-90). Brit. churchman, 5-398, 3-291.

Newmarket. Tn. 14 m. N.E. of Cambridge; pop. 20,219; hq. of horse racing in U.K., 5-399; horse racing 4-198, 2-183, 3-76.

Newmarket Town Plate. Horse race instituted by Charles II in 1665; 5-399.

New Mexico. State of S.W. U.S.A.; area 121,666 sq. m.; pop. 681,187; cap. Santa Fé; 5-400.

New Model Army. The reorganized Parliamentary army in the Eng. Civil War, 1-218, 2-531.

New Netherlands. Dutch colony established in Amer. in 1614; afterwards remained New York by Eng.

Newnham College. Women's college of Cambridge Univ., 2-182.

New Orleans. Port on Mississippi in Louisiana, U.S.A.; pop. 570,410; 5-400, 5-451 illus.

New Plymouth, New Zealand. Spl. and rly. terminus on W. coast of North Isl.; pop. 20,640; flour mills, leather mfrs.; trade in dairy products.

New Pomerania. See New Britain.

Newport, Eng. Port in Monmouthshire on Usk; pop. 105,285; coal, in a cattle trade; shipbuilding; non products; scene of a Chartist riot, 1839 in which many thousands of miners took part; 5-245.

NEWPORT

Newport, Tn. In Isle of Wight, of which it is the cap.; Carisbrooke Castle and Parkhurst Prison are near by; pop. 20,426.

Newport, Rhode Island, U.S.A. Resort on S.W. coast of Rhode Island; pop. 37,564; yachting centre.

Newport News, Virginia, U.S.A. Spt. and shipbuilding centre on James r., at entrance into Hampton Roads; pop. 42,358.

New Radnor, Wales. Vil. in Radnorshire; ruins of a castle destroyed by Owen Glendower remain; 6-353.

New River. Artificial waterway in Herts and Middx, Eng., constructed 1609-13 to supply London with water, 4-172.

New Scotland Yard. H.q. of the Metropolitan Police, London, 6-248; laboratories and map room, 6 219 illus.; and fingerprints, 3-353.

New Siberia. Group of isls. in Arctic Ocean N. of Siberia; largest Kotelnol (116 m. by 100 m.); uninhabited except for hunters.

New South Wales. State in S.E. Australia; area 309,432 sq. m.; pop. 3,317,182; cap. Sydney; 5 402, 1-318; named by Cook, 1 317, 2 495; transportation of convicts, 1 318.

Newspaper and Periodical Library, at Brit. Museum, 2-90.

Newspapers, 5 403; first Amer. newspaper, 5 189; Beaverbrook and, 1-101; use of cable, 2 412; Camrose, 2 191; half-tone illustrations, 6-293; Northcliffe and the popular newspaper, 5 157; photographic copies of, 4 188, printing, 6 288; process engraving, 6 292.

Newstead Abbey, Notts, Eng.; Byron's home, 3 288 illus.

New Stone Age. See Neolithic Age.

New Style Calendar. See Gregorian Calendar.

New Sweden. Former Swedish colony in U.S.A., 1 m. S.W. of Philadelphia, Pa.; founded in 1638.

Nowt. Genus of small, four-limbed, tailed amphibia, 5 407, 1 157 illus.; foot, 3 113 illus.; proteins, 6-297.

New Testament, of Bible, 1-441; Erasmus' edition, 3 295; Gk. testament and Gk. language, 4-94.

Newton, Sir Isaac (1642-1727). Eng. physicist and mathematician, 5 408; and atoms, 1 299; and binomial theorem, 1-107; and calculus, 5 158; his names for colours, 2-102; theory of gravitation, 4 65, 1 282; works in Latin, 4 149; experiments with light, 4 198, 7-128 illus. f.; laws of motion, 5-159; and planets, 6 212; speed of sound experiment, 3 156; and the spectrum, 7-127; steam jet propulsion, 4-371; and steam vehicle, 6 412; invented the reflecting telescope, 7-248; statue by Grinling Gibbons, 4-19.

Newton, John (1725-1807). Brit. clergyman and poet; collaborated with Cowper, 2-522, 4 226.

Newton. The unit of force in the metric-kilogram-second system. It is the force required to give a mass of one kilogram an acceleration of one metre per sec. per sec., and is equal to 100,000 dyne (q.v.).

Newton, Mt. Highest peak in Spitzbergen, 5,676 ft., 7-137.

Newtonian Physics, and relativity, 6-350.

Newton's Rings, and interference of light, 4-500 diag.

Newton Wonder. Cooking apple, 1-186 illus. f.

Newtown. Tn. in Montgomeryshire, Wales, on r. Severn; formerly centre of Welsh flannel industry; pop. 1,152; 5-255.

Newtown Butler, tn. in co. Fermanagh, N. Ireland; pop. 358; 3-346.

New Westminster. Tn. of British Columbia, Canada; pop. 28,639; salmon canning and timber shipping chief industries; 2-80.

New Year's Day. Festival, 5-409; New Year changed from March to Jan. (1752), 2-175.

New York City. Largest city of U.S.A.; pop. 7,891,957; area 359 sq. m.;

5-410; docks, 3 97 illus. f.; foreign pop., 5-414; captured by English, 2-308; harbour, 5-418 illus.; skyscrapers, 5-417, 420 illus.; transport, 5-413, 415, 416 illus.; World's Fair, 3-328.

New York State. U.S.A.; area 49,576 sq. m.; pop. 14,830,192; cap. Albany; 5 416.

New Zealand. Country of Brit. Commonwealth in S. Pacific Ocean; area 103,935 sq. m.; pop. 2,102,580 (including 123,000 Maoris); cap. Wellington; 5 422, 7-437; map, 5-422; flag, 3-384 illus. f.; Antarctic territories, 1-169; apteryx, 1-186; birds and fish, 5-425; colonization, 2-83; and Cook Isls., 6 31; Franz Josef glacier, 4-25 illus.; hydro-electric station, 4-216 illus.; meat production, 5-154. See also Earthquakes (11st).

Ney, Michel (1769-1815). Marshal of Fr.; commander in Napoleonic Wars; at battle of Waterloo, 7-129.

Ngauruhoe. Active volcano on N. Island, New Zealand (7,515 ft.), 5-422.

Niagara Falls. Waterfalls on lower portion of Niagara r., N. Amer., 5 427; hydro-electric power from, 4 218; Blondin's crossing, 1-188 with illus.

Niagara Falls, N.Y., U.S.A. Resort and industrial city on Niagara r.; pop. 90,872; enormous water-power generates electricity; electro-chemical works; Niagara University.

Niagara Falls, Ontario. City and port opposite Niagara Falls, N.Y., U.S.A.; pop. 22,874; enormous hydro-electric plant; cereals, iron products, carboniferous, hats, silverware.

Niagara River. Outlet of Lake Erie flowing N. to L. Ontario, 33 m., 5 429, 2 196.

Nibelungenlied. See Nibelungs, Song of the.

Nibelungs, Song of the. Ger. epic of 13th cent., 5-429.

Nicaea (Nikēa) or Nice (modern Isnik). Important anc. city of Bithynia, Asia Minor, on L. Ascania; declined under Turkish rule (14th cent.); famous Church Council (A.D. 325), 2-189, 2 379.

Nicaea. Gk. settlement on site of modern Nice, France, 5 431.

Nicaragua. Republic in Cent. Amer.; area 57,143 sq. m.; pop. 1,067,023; cap. Managua, 5-430, 2-202, 293; flag, 3 385 illus. f.

Nicaragua, Lake. Nicaragua repub., Cent. Amer.; 3,000 sq. m. in area; sharks in, 5 430 with illus.

Nicaria (Nikahēa). Anc. Nicaria, Gk. isl. in Aegean Sea; 83 sq. m.; produces charcoal, sponges.

Niccoli, Niccolò de' (1363-1137). It. scholar, and Florentine Library, 6-386.

Nice. Pleasure resort on Fr. Riviera; pop. 211,165; 5 430.

Nicene Creed. Statement of Christian belief, drawn up at Nicaea in 325, 2 379.

Niche (nich). In architecture, a cavity or hollow place in the thickness of a wall for placing a statue, figure, vase, or other ornament.

Nicholas, St. (d. c. 342). Bishop of Myra, Asia Minor; in many legends, bountiful patron of children; his feast day (Dec. 6) is near Christmas; hence he comes to be the Christmas gift-bringer, "Santa Claus"; Dutch children's festival, 2-382.

Nicholas I. Pope 858-867; one of the most vigorous of the early popes, uncompromising in upholding his claims to universal jurisdiction; first pope of whom it is recorded that he was formally crowned.

Nicholas II. Pope 1059-61; he restricted election of popes to College of Cardinals; Hildebrand (later Gregory VII) was leading spirit of his pontificate.

Nicholas IV. Pope 1288-92; General of the Franciscans in 1274 (first Franciscan Pope); tried to rouse Christian world against advancing Muslims; and Roger Bacon, 1-341.

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Nicholas V. Pope 1447-1455; founded valuable library and manuscript collection; extended wide patronage to classical scholars of Renaissance; 6-386.

Nicholas I (1796-1855). Tsar of Russia, 5-431, 6-474.

Nicholas II (1868-1918). Last tsar of Russia; reigned 1894 to 1917, 5 431, 432 illus., 6-474.

Nicholson, Sir William (1872-1949) Brit. artist; one of the "Bogan-staff Brothers," who turned Brit. poster-designing into an art.

"Nicrome." Alloy used for heating elements in electric fires, 5-432.

Nicias (nikh'as) (d. 413 B.C.). Athenian statesman and general in Peloponnesian War; became leader of aristocrats on death of Pericles; arranged Peace of Nicias (421 B.C.) between Athens and Sparta, which terminated first decade of Peloponnesian War.

Nickel (Ni). Metallic element; atomic no. 28; atomic weight 58.69; density 8.9; 5 432, 3 221; alloys, 1 111, 115; in Canada, 2-196; nickel silver, 1 115; in stainless steel, 4 296.

Nickel. Amer. coin, value 5 cents or one twentieth of a dollar; zinc in, 5 132.

Nickel Silver. Alloy of copper, nickel and nickel used for cutlery and as basis of silver-plated ware, 5 432.

Nickel Steel, an alloy, uses, 5-432

Nicknames, 5 433.

Nicobar Islands. Group of 19 isls. in Bay of Bengal; area 635 sq. m.; pop. 12,000. Copra and betel nuts chief products. Fishing chief industry, with the Andaman Isls. they form a centrally admin. territory of India.

Nicodemus. In New Testament, a prominent Pharisee, who visited Jesus by night as an inquirer (John 11).

Nicolet, Jean (1598-1612). Fr. explorer of N. America, 1-146, 5-192.

Nicomedia or Aetia Nicopolis. Anc. city of great splendour on E. arm of Propontis (Sea of Marmara); cap. of Bithynia; Constantine died here and Huns had committed suicide near by; modern Ismit.

Nicopolis or Nikopol, Bulgaria. Tn. in N. on Danube, at junction with Orem; pop. 6,000.

Nicopolis. Important anc. city, now in ruins, in Epirus on W. coast of Greece; founded 31 B.C. by Emperor Augustus to commemorate his naval victory of Actium.

Nicosia. Cap. of Cyprus; also called Levkosia; mfrs. silk and leather goods; pop. 37,728; 3-21.

Nicot, Jean (1530-1600). French ambassador to Portugal; helped to spread the popularity of tobacco; nicotine named after, 3-282, 7-286.

Nicotiana. The tobacco plant genus, named after Jean Nicot, 7 286.

Nicotine. A poisonous oil extracted from leaves of the tobacco plant, 7 288, 289, 6-236.

Niothroy. Cap. of state of Rio de Janeiro, Brazil, 6 403.

Niemen (nē mēn). R. of U.S.S.R., 550 m. long; rises in White Russia S.S.R., flows W. and then N. and W. through Lithuanian S.S.R. to Baltic at Memel; highway for lumber and farm products; called Memel at mouth; 4-323.

Niemöller (nē mēler), Martin (b. 1892). Ger. religious leader. During 1st World War famous as U-boat commander. He became pastor of the Evangelical Church at Dahlem, Berlin. Opposed Nazi control of religion. Arrested in 1937 and 1938; imprisoned, 1939-45.

Niepe, Joseph Nicéphore de (1765-1833). Fr. physicist, one of the inventors of photography, 6-170; also invented the ekelepede, a forerunner of the bicycle.

Nietzsche (nēts'h'e), Friedrich Wilhelm (1844-1900). Ger. philosopher, exalted self-assertion, the "will to power," as the final self-justifying

NIEUPORT

good in life; denounced Christian virtues of pity and humility as "slave morality"; died insane, 6-160.

Nieuport. Tn. of Belgium on riv. Yser. 10 m. s.w. of Ostend. Has fisheries.

Nieuwveldt [nyé'vél't] or **Nieuwveld Mts.** Division of main range in prov. of Cape of Good Hope, S. Africa.

Nieuwe Waterweg. Canal connecting Rotterdam with North Sea, 6-455.

Nifnham [nif'nham]. In Norse myth. land of eternal cold and night.

Nigeria. Federation in lower basin of riv. Niger, in W. Africa; area about 372,000 sq. m.; pop. est. 31,500,000; cap. Lagos; 5-435, 7-140; broad-casting, 6-318; young girls (costume), 2-344 illus.

Niger River. Third largest river of Africa, 2,600 m. long, 5-434; explored by Mungo Park, 6-86.

Night-blindness. Why it occurs, 3-334

Night-hawk. See **Nightjar.**

Night-heron. 4-170.

Nightingale. Florence (1820-1910) Brit. nurse and hospital reformer, 5-437, 2-532, 5-185.

Nightingale. A song-bird, 5-438; eggs, 1-452 illus. f.; migration, 5-204 illus. f.; nesting habits, 1-455, 1-462 illus.

Nightjar. Bird, 5-438; eggs, 1 459 illus.; foot, 1 471 illus.; migration, 5-204 illus. f.

Night Sates. provided by banks, 6-484

Nightshade. Poisonous plant, 5 439.

Night Watch. The. Popular name for a famous painting by Rembrandt, and Rembrandt's unpopularity, 6-383.

Nigre. One of the solutions obtained in soap making, 7-80.

Nigri Sembilan. Malayan state. See **Negri Sembilan.**

Nihilist Movement. Revolutionary movement in 19th cent. Russia, 6-174.

Niihau. One of the Hawaiian Isls., area 72 sq. m.; pop. 222; pine apples and sugar cane, 4-139.

Nijinsky [nijin'ski], **Vaslav** (1890-1950). Russian dancer and choreographer. Member of Diaghilev's Russian Ballet. Ill-health cut short his career in 1917. Choreographer of *L'après-midi d'un Faune* and *Le Sacre du Printemps*; 1-352.

Nijmegen [nijmégen]. Tn. of Netherlands, in Gelderland prov., on the R. Waal, 104 m. s. of Arnhem; brewing, leather and tobacco mfrs.; pop. 114,114; occupied by Ger. May 1940; here Allied airborne troops were dropped Sept. 17, 1944, to prevent destruction of bridges, in attempt to link up with the airborne forces at Arnhem, 1 253 5-370.

Nika. Gk. goddess of victory, winged victory, 5-47 illus.

Nikisch [né'kish], **Arthur** (1855-1922) Hungarian orchestral conductor noted for interpretations of Wagner

Nikkō [nék'kō]. Religious centre in Japan, noted for Shintoist and Buddhist temples.

Nikoliev. Port in Ukraine, on Black Sea near mouth of r. Bug; pop. 187,100; built by Potemkin, 6 174

Nikopolis (Bulg.). See **Nicopolis.**

Nile. Longest r. of Africa, about 3,500 m. long, 5-439, 1 10, 5-226 in Egypt, 3-172; dams and barrages, 3-33; Nile delta, 3-171 (map); early civilization in lower valley, 1-32; feluccas on, 3 179 illus.; in flood, 3-178 illus.; and Isis legend, 4 301; linen first made in Nile valley, 4-514; river landscape, 5-141 illus.; sources and Sir Samuel Baker, 1-348; explored by J. H. Speke, 7-397; drains Uganda 7-343.

Nile, Battle of the (1798). Fr. fleet des. troyed by Nelson, 5-363, 364 illus., 5-318.

Nilgai. Species of antelope native to the Indian sub-continent.

Nigiri [nigiri] Hills. Plateau in s. India; highest point 8,760 ft.; 5-69.

Nimbo-stratus. clouds, 2-423.

Nimbus. a rain cloud, 2-421.

Nimes (nēm). City s. Fr.; pop. 93,000; silk, wine market; Rom. ruins; amphitheatre, 6-439 illus.; Pont du Gard, 1-190, 189 illus.

Nimitz. Adm. Chester (b. 1885). O.-In-C. U.S. Pacific fleet 1941-45; victor of Coral Sea 1942; signed Jap surrender, 1945; and Kashmir, 4-394.

"Nimonic." An alloy of nickel and chromium, 5-432.

Nim'rod. In Gen. x, 8-9, great hunter; founded Babylonia and Assyria.

"Nimrod." See **Apperley, G. J.**

Nimrud (anc. tn.). See **Kalah.**

Niña (nēn'ya). A caravel of Columbus on his first voyage to America.

Ninepins (game). See **Skittles.**

Ninety-five Theses. of Luther, 6-376.

Nineveh. (cap. of anc. Assyrian empire, 5-440; Assurbanipal's library, 2-2; palace sculptures, 1-338; sacked by Medes in 612 B.C., 5-176, 5-160.

Ningpo [ningpō], China. Former treaty port on r. Ningpo; pop. 218,770; commerce in tea, silk, cotton, carpets, fish, and sugar.

Niobe. In Gk myth., wife of Amphion, king of Thebes, by whom she had 12 children. She mocked the goddess Leto, who had only two children, Apollo and Artemis, and in revenge Apollo and Artemis slew Niobe's children. Niobe was turned into a weeping stone.

Niobium (Nb.). An unimportant hard white metallic element of the tantalum sub-group; atomic no. 41; atomic weight 92.91; 3-224, 7-224.

Nipigon. Lake, Ontario, Canada, 70 m. long and 40 m. broad; area 1,730 sq. m. In it are about 1,000 islands, 2-195.

Nipkow. Paul (1860-1940). Ger. scientist, inventor (1884) of the revolving disc method of television scanning, 7-231.

Nip'pon. Native name for Japan; means "land of the rising sun"; Dai Nippon, "Great Nippon."

Nippon Theatre. Tokyo. Principal theatre in Japan, 7-288 illus.

Nippur [nip'pūr]. Anc. city of Mesopotamia (Iraq); flourished 4000 B.C.; excavated by Univ. of Pennsylvania; 2-2.

Nirvana. State of unity with infinite aimed at by Buddhists, 2-108.

Nish [nésh], Yugoslavia. Serbian tn., pop. 35,460; anc. Naissus, birth-place of Constantine the Great; held by Turks 1456-1878; strategic value of the place due to converging road and railways; occupied by Germans during 1941-44.

Nissan. Isl. in Bismarck Archipelago, off New Guinea.

Nith. Scot. R. flowing to Solway Firth; 55 m. long, 3-134.

Nitrates. Salts of nitric acid, HNO₃, which result from replacing the hydrogen by a metal or a radical, produced by bacteria, 5-443; used in chemical fertilisers, 5-444; deposits in Chile, 2-358, 7-97; lucerne as nitrate gatherer, 5-49.

Nitre. Potassium salt similar to salt-petre, known chemically as potassium nitrate, 6-192.

Nitric Acid. 5-442, 1-12; and nickel, 5-432.

Nitrosarian Particles. Name given to oxygen by John Mayow, 1-81.

Nitro-cellulose. See **Guncotton.**

Nitrogen (N). An inert gaseous element of the phosphorous group; atomic no. 7; atomic weight 14.008; 5-443, 3-231; in air, 1-79, 81; in ammonia, 1-140; artificial fixation in ammonia synthesis, 2-326; and divers' bonds, 3-95; in explosives, 3-329; nitrogen industry, 2-326; peas and nitrogen compounds, 6-99; and plant life, 6-217, 1-344; in proteins, 6-297.

Nitrogen Peroxide. a very poisonous brown gas, soluble in water, giving nitrous and nitric acids, 5-442.

Nitroglycerine. Oily liquid made by treating glycerine with a cold mixture of concentrated nitric and sul-

NORDAU

phuric acids. Main explosive constituent of dynamite and guncotton.

Nitrous Oxide ("laughing gas") Colourless gas, heavier than air, with sweet taste and smell. Used as mild anaesthetic, 1-142, 5-443.

Nivelle. Robert Georges (1856-1924). Fr. soldier; c.-in-c. of Fr. armies, Dec. 1916; succeeded by Foch, May 1917, after costly failure of spring offensive; c.-in-c. of Fr. army in N. Africa, Dec. 1917-19.

Nizam [nizahm']. Ruler of Hyderabad, India.

Nkrumah, Kwame (b. c. 1909). Prime Minister of the Gold Coast since 1959; 4-41 (caption).

N.K.V.D. See under **M.V.D.**

Nô. Jap. classical drama, illustrated in Jap. art, 4-353.

Noah and Noah's Ark. 5-445.

Noailles [nô'ye], **Adrien Maurice**, 3rd Duke of (1678-1766). Fr. general at battle of Dettingen.

Nobel (nobel'), **Alfred Bernhard** (1833-96). Swedish chemist and engineer, who founded Nobel prizes, 5-445.

Nobel Prizes. 5-445.

Nobile [nô'bèl], **Umberto** (b. 1885) Italian airship designer, aviator, and Arctic explorer; designed airship *Voyage* and *Italia*; polar flights, 6-245.

Noble. Obsolete Eng. gold coin, first struck by Edward III, 1314. Original value 6s. 8d. Half and quarter noble pieces were also coined.

Nocera Inferiore [nôché'râ infer'ôré], Italy. City 20 m. s.e. of Naples, pop. 20,000; linen and woolen mfrs., anc. Nuceria Alfaterna, reduced by Hannibal 216 B.C.

Noctuidae. Family of moths, incl. owl, tiger, cimine, footmen, etc

Noctule Bat. 1-380, 381 illus.

Nocturne. See **Musical Terms** (list)

Noct. In botany, the point where a leaf is attached to a stem, in astronomy, one of the two points diametrically opposite each other in which the orbit of a heavenly body cuts some great circle; in acoustics the central point or points at rest in a vibrating body, 7 86

Noel [nôel], **Bonhomme** (Father Christmas).

Noguera. R. of Spain rising in Pyrenees and flowing s.s.w. to join the Segre 20 m. n. of Lerida, 6 314

Noise. See **Sound**; **Ultrasonics**; for units of measurement of noise, see **Decibel**; **Phon**.

Nokomis. Grandmother of Hiawatha in Longfellow's poem of that name in story, 5-35.

Nomads. Peoples with no permanent homes, owning herds of animals, and who wander in search of pasture 5-446, 5-109.

Nombre de Dios [nom'brâ dâ dé'ô]. Port of Panama, on Caribbean Sea founded by Columbus in 1502.

Nome (nôm). Alaska. Gold-mining tn and apt. in centre of w. coast on Seward peninsula; pop. 1,876 20,000 during rush of 1899-1900

Non-commissioned Officers (N.C.Os.), in Brit. army, 1-232; in R.A.F., 6 162

Nonconformists. See **Free Churches.**

Nones. In anc. Rom. calendar the 9th day before the Ides, falling in March May, July, and Oct. on 7th of month in other months on 5th, 2-174.

Nones. Canonical hour of prayer in R.C. Church, 5-244.

Nonsuch. Palace built by Henry VIII nr. Cheam, Surrey (begun 1538) pulled down 1680, 3-231 illus.

Noot'ka Indians. Tribe of N. Pacific area, dwelling on Vancouver I. and in s. British Columbia. Indians gave name to sound and isl. on w. coast of Vancouver Isl.

Nopales. Thornless cactus; *Coccolactis* and cochineal, 2-183.

Norbert, St. (d. 1134). Ger. ecclesiast. archbishop of Magdeburg; founder of the Premonstratensians.

Norbertines. See **Premonstratensians.**

Nordau [nor'dow], **Max** (1849-1923) Jewish author and philosopher, b. Hungary; leader in European Zion-

NORDENSKJÖLD

movement (*Degeneration*, criticism of modern civilization and art); critic of politics and social science.

Nordenskjöld [nor'denzhōld], Nils Adolf Erik, Baron (1852-1901). Swedish Arctic explorer, first to accomplish (1878-80) the North-East Passage from Atlantic to Pacific.

Nordfjord, Norway, 5-464 illus.

Nördlingen [nōrt'lingen], Tn. in Bavaria, s. Ger.; in Thirty Years' War, scene of imperialist victory over Swedes (1634).

Nore, The. Sandbank at mouth of r. Thames, marked by lightships. At nearby anchorage occurred the *Nore Mutiny* of 1797, 6-285.

Noreia, Battle of, 113 a.c., defeat of Rom. army, 4-5.

Norfolk, E. co. of Eng.; area 2,054 sq. m.; pop. 548,550; co. tn. Norwich 5-447; the Broads, 3-232 illus.

Norfolk, Virginia, U.S.A. Spt. on Elizabeth r. opposite Portsmouth; pop. 213,513; trade in lumber, coal, peanuts, fruit, etc., 7-403.

Norfolk Island, Islet in Pacific; area 13 sq. m.; pop. 733. Descendants of mutineers of the *Bounty* were moved here (1856) from Pitcairn Island; admin. by Australia, 1-319.

Norism, Rom. prov., with Rhaetia formed Duchy of Bavaria, 1-387.

Norman Conquest of Eng., 3-276, 7-451; Halley's comet as omen, 2-472.

Normandy, Anc. prov. of Fr. on Eng. Channel; pop. 2,438,911, 5-448; geography and climate, 3-433.

Normandy Invasion, Combined operation of 2nd World War that began the liberation of Europe. The date and time of the initial *kin angels* (June 6, 1944) were given the code name D Day; 5 450, 7-494, 497 illus., Mulberry Harbours, 5-290.

Normans, Northwestern who founded Normandy, 3-314; architecture 1-210; names for meat, 5 153; and Hereford cattle, 2-273; conquest of s. Italy and Sicily, 4-308, 7-50. See also Danes; Vikings.

Normanton, Tn. and port in Queensland, Australia, on r. Norman; pop. 386, 6-324.

Norns, In Norse myth., the three Fates (Urd, personifying the past; Verdandi, the present; Skuld, the future); Asgard was their home.

Norrköping [nor'chöping], Sweden. Spt. on s.e. coast; pop. 82,000.

Norrland, N. prov. of Sweden, 7-201

Norroy King-of-Arms, 4-165.

Norsel, Ship used in expedition to Queen Maud Land, 1950-52, 1-170.

Norse mythology, 1-310, 5-312.

North, Christopher (pseud.). See Wilson, John.

North, Frederick, Baron (1732-92) later Earl of Guilford (better known as Lord North), Brit. statesman; as king's agent (disclaimed title of prime minister) supported George III's policies which led to Amer. Rev.; fall of, and Yorktown surrender, 1-139.

North, Sir Thomas (1535-1601). Eng. translator of Plutarch (first edition 1579); vigorous style greatly influenced Eng. prose.

North America, Continent; area 7,200,000 sq. m.; pop. about 188,000,000, 5-452; maps, 1-137, 5-452, 453 f.; Asian land-bridge theory, 1-90; Audubon's work on N. Amer. animals, 1-307; bears in N. Amer., 1-390; climate, 2-409; exploration, 1-133, 134, 6-362; fisheries, 3-378, 380; George III and Amc. colonies, 3-621; ice age, 4-228; Seven Years' War, 7-2. See also America; Canada; United States.

Northampton, Town on r. Nene, pop. 104,429; shoe mfrs.; co. tn. of Northamptonshire; battle in 1460 in which Yorkists captured Henry VI; 5-456.

Northamptonshire, Co. of Eng.; area 998 sq. m.; pop. 359,550; co. tn. Northampton, 5-456.

North Atlantic Treaty Organization, 5-457, 3-319, 7-354, 7-363, 7-498.

North Berwick, Tn. in East Lothian, Scot.; pop. 4,001; 5-40.

North Carolina. See Carolina.

North Channel, Separates Ire. from Scot. and connects Irish Sea and the Atlantic Ocean, 4-281.

Northcliffe, Alfred Charles William Harmsworth, Viscount (1865-1922) Brit. newspaper proprietor, 6-457.

North Dakota. See Dakota, N. and S.

North Downs (hills). See Downs.

North-East Passage, Name of route round N. of Europe and Asia to the Pacific. The Eng. travellers Wiloughby and Chancellor attempted it in 1533, and the Dutch navigator Barents in 1594-95, but all failed. First accomplished successfully in 1878-80 by Nordenskjöld; explorations, 6-242, 1-134.

Northern Ireland, Division of Ireland, comprising the greater part of the prov. of Ulster; part of the U.K.; area, 5,237 sq. m.; pop. 1,370,709; cap. Belfast; 5-458; dairy farming, 3-26; drying flax, 3-347 illus.; Giant's Causeway, 4-18 with illus.; police force, 5-252; religious denominations, 4-281; first parl. opened, 4-283.

NOTRE DAME DE PARIS

Northumberland, John Dudley, Duke of (1502-53), Eng. statesman; executed for high treason, following discovery of plot to put Lady Jane Grey on throne, 4-98.

Northumberland, Northernmost co. of Eng.; area 3,018 sq. m.; pop. 798,173; co. tn. Alnwick, 5-461.

Northumbria [north'umbria], Anc. kingdom of Brit., extending between the Forth and the Humber; most powerful in 7th cent.; made tributary to Wessex in 827, 5-461; bagpipes, 1-347.

North Walsham, Tn. in Norfolk, Eng., pop. 4,733; main industry vegetable canning, 5-448.

North-West Frontier Provinces (N.W.F.P.), Northernmost prov. of Pakistan; area (with native agencies and tribal dists.) 89,270 sq. m.; pop. 5,899,005; cap. Peshawar. Khyber Pass leads to Afghanistan, cereals chief products, 5-41, 4-259.

North-West Passage, Sea route N. of America once thought to afford a short cut to China, 1-131, 135 illus.; attempts to discover, 2-200; Fro-bisher and, 3-471; Franklin's expedition, 3-461, 6-242.

N. IRELAND COUNTIES AND COUNTY TOWNS

COUNTY	COUNTY TOWN	AREA, Sq. m.	POP
Antrim	Antrim	1 176	674,800
Armagh	Armagh	489	114,255
Down	Downpatrick	951	215,105
Fermanagh	Keshkillen	653	53,040
Londonderry	Londonderry	816	155,520
Tyrone	Omagh	1,218	132,040

Northern Lights. See Aurora Borealis.

Northern Rhodesia, Part of the Central African Federation; area 287,160 sq. m.; est. pop. 1,730,100. Lusaka is the seat of govt., 5-394.

Northern Territory, A division occupying the N. cent. part of Australia, directly administered by the Commonwealth govt.; 523,620 sq. m.; pop. 10,866; gold, tin, copper; cattle-raising, 1-310.

Northern War (1699-1721). Between Charles XII of Sweden and Denmark, Russia, and Poland.

North Foreland, Headland, on the N.E. coast of Kent.

North Island, New Zealand, area 44,281 sq. m.; pop. 1,313,920, 5-422.

North Magnetic Pole, 5-460, 6-246; and navigation, 5-83.

Northmen. See Vikings.

North Pole, Geographical, 5-460; compared with S. Pole, 1-164; aerial view, 6-243 illus.; Byrd's flight over, 2-147; reached by Peary, 6-103; polar exploration, 6-242; height of troposphere at, 1-80.

North Rhine-Westphalia, Land of Federal Republic of Ger.; area 13,100 sq. km.; pop. 13,196,176; cap. Düsseldorf, 6-391, 4-3.

North Riding, One of the three admin. divisions of Yorks, Eng., area 2,128 sq. m.; pop. 378,160; admin. centre Northallerton. Mainly agricultural. Iron ore deposits in Cleveland dist.

North Ronaldsay, Most northerly isl. of Orkneys, Scot.; farming, 6-4.

North Sea, That part of the Atlantic Ocean between Gt. Brit. and Europe; area about 190,000 sq. m., 5-460; geological formation, 3-310.

North Sea Canal, and Amsterdam's shipping, 1-141.

North Shields, Port on N. bank of Tyne, near mouth, opposite S. Shields; incorporated with Tynemouth; shipbuilding and mfr. of ships' cables and anchors; trade in coal, 5-394.

North Somerset, Large isl. of Arctic Amer., directly N. of Boothia; area about 10,000 sq. m.

North Star or Polaris, Star nearest in line above North Pole; how to find, 2-491, 490 diag.

North-West Territories, Region consisting of about one-third of Canada; area 1,309,680 sq. m.; pop. 16,004, 5-461.

Northwich, Tn. of Cheshire, Eng., 18 m. S. of Manchester, pop. 20,820; brewing, salt, alkali.

Norton, Col. Edward Felix (1881-1954). Everest expedition (1921), 3-321.

Norway, Kingdom of N.W. Europe in W. part of Scandinavian peninsula; area 124,556 sq. m.; pop. 3,341,000; cap. Oslo, 5-462; map, 5-463; flag, 3-384 illus. f.; plants and animals, 5-464; fishing industry, 3-379; Antarctic territories, 1-170. Mid night Sun, 5-200 with illus. f.; history, 5-463; and Iceland, 4-232; rule in Isle of Man, 5-110; and Shetland, 7-27, in 2nd World War 7-487; Quisling, 6-325.

Norway Spruce, European species of spruce, 7-139.

Norwich, Alfred Duff Cooper, Viscount, (1890-1954). Brit. Conservative politician and writer. Resigned from Chamberlain govt. Oct. 1938 in protest against Munich pact. In Churchill's govt. (information and other posts), 1940-43; ambassador to Paris, 1944-47. Wrote *Lives of Talleyrand, Haig, and an auto biography, Old Men Forget* (1953).

Norwich, Co. tn. and cath. city of Norfolk; pop. 121,226, 5-467; market place, 5-253 illus.

Nothing. See Architectural Terms.

Notation, in music, 5-303.

Note, Short-term security, companies sometimes issue certificates (called promissory notes) promising to repay principal within a short period—five years or less—without any mortgage; bonds secured by mortgage are also called notes.

Notize Soritte, Hand-written news bulletin issued by Venetian Republic in 16th cent., 5-407.

Notohord, A supporting rod of gristle in the back of a very young animal, 7-394.

Notre Dame, Cathedral, Paris, 6-81, 84 illus.

Notre Dame de Paris, Novel by Victor Hugo, pub. 1831, 4-201.

NOTRE DAME MTS.

Notre Dame Mts. Quebec, Canada, 6-321.
Nottingham, Eng. City 110 m. n.w. of London, on r. Trent, co. tn. of Nottinghamshire; pop. 308,000; centre of lace and hosiery mfr. 5-468, 4-432; public library, 4-487 illus.
Nottingham, University of, 5-168, 7-368 illus.
Nottinghamshire. Co. of Eng.; area 814 sq. m.; pop. 840,870; co. tn. Nottingham; 5-467.
Notus. In Gk. myth., the south wind.
Nought, in numerals; introduction of, 5-475.
Noun, in grammar, 5-468, 4-55.
Novaya Zemlia. Two isls. in Arctic Ocean, belonging to Russia, 1-220.
Nova Scotia. Maritime prov. of Canada; area 21,008 sq. m.; pop. 612,581; cap. Halifax; 5-469.
Novel, in literature, 5-470; 18th cent. Eng. writers, 3-288; Russ. 19th cent. novelists, 5-480; Scott and the historical novel, 6-518.
Novella. Italian name for a short story; novel derived from, 5-471, 4-330.
Novello, Ivor (1893-1951). Brit. actor-dramatist; wrote musical plays, (*Glimorous Night, Crest of the Wave, The Dancing Years, Perchance to Dream, King's Rhapsody*).
November. 11th month of the year; in Rom. calendar, 5-255.
Noverre, Jean (1721-1810). Celebrated Fr. dancing-master; influence on ballet, 1-351.
Novgorod [nov'gorod], historic tn. in w. Russia, 100 m. n. of Leningrad, pop. 31,000; old fortress; great trade centre in Middle Ages.
Novitsiate [nov'ish'iat], in Rom. Cath. Church, state or time of probation of one who has entered a religious house as a novice, but has not yet taken vows.
Novocaine, a local anaesthetic, extensively used by surgeons.
Novorossiaik', Rus. sp. in Caucasus, on N.E. of Black Sea; pop. (1939) 95,280.
Novosibirsk', Chief city of w. Siberia, formerly Novo-Nikolaevsk'; on r. Ob, and important rly. junction on Trans-Siberian and Turkestan railways; 7-16, 49 illus.
Noyes, Alfred (b. 1880). Brit. poet ("Tales of the Mermaid Tavern"; "The Wine Press"; "Diuke, an English Epic"; "The Eldin Artist"; "The Torch-Bearers"); virile, patriotic note in his work.
Noyon [noyaywon'], Fr. historic tn. 60 m. N.E. of Paris; pop. 7,300;

Charlemagne crowned king in 768; birthplace of Calvin.
Nu, n, N (Rom. n. N). Thirteenth letter of Gk. alphabet.
Nubia, region in Africa, s. of Egypt, including Nubian desert.
Nubian Desert. Great desert in Sudan between Red Sea and w. bend of r. Nile.
Nubian Goat, 4-37 illus.
Nuclear Fission, theory of, 1-300; radio-activity, 6-351.
Nuclear Physics. See **Atom**; **Atomic Energy**; **Cyclotron**; **Electron**; **Radio-Activity**.
Nuclear Reactor, or Atomic Pile, 1-301, 302 illus.
Nucleons. Sub-atomic particles, either protons or neutrons, 1 300, 1 298.
Nucleoplasm, form of protoplasm.
Nucleus [nu'kleus] (from Lat. word for "kernel"). A minute body within a cell, 6 298; of atom, 1 300, 1-298; disintegration of, 3 17.
Nudauretta Zaddaahil. Moth, 2-113 illus.
Nuevo Leon [nwa'vō lōn], Mexico. State in N.W.; area 25,000 sq. m.; pop. 511,140; cap. Monterrey.
Nuffield, William Richard Morris, Viscount (b. 1877). Brit. motor manufacturer and philanthropist 5-473; mass-production methods, 5-283.
Nuffield College, Oxford Univ., 6 18.
Nuffield Foundation. Trust fund established by Lord Nuffield in 1913, the interest being used for medical research, the development of medical and health services, scientific research and teaching in the interests of trade and industry, the pursuit of social studies, and the care and comfort of aged persons, 5-474.
Numa Pompilius. Ruler of anc. Rome, guided by the nymph Egéria, 6-429.
Number, in grammar, 7-390.
Numbers, 5-474; series, 6-532.
Numbers, Book of. Fourth Book of Old Testament, so called because it begins with account of census; includes part of history of Israelites during their wanderings.
Numerals, 5-475; Arabic, 5-90; arithmetic, 1-237.
Numidia [numid'ia]. Anc. kingdom and Rom. prov. in N. Africa corresponding nearly to Algeria.
Numismatics. The science of coins and medals. See **Coinage**; **Money**.
Nuncio, a diplomatic representative of the Pope, of lower rank than a legate; his powers are limited by his instructions.

OASTLER

Nuneaton. Tn. in Warwickshire, on r. Anker, 9 m. N. of Coventry; has cotton, woollen, brick, tile, and iron industries; pop. 51,400.
Nunez [noo'nyeth] **de Arce, Gaspar** (1834-1903). Span. writer and statesman; governor of Barcelona (1868); cabinet minister (1882-90); noted for his lyrics.
Nunnery. See **Convent**.
Nuns, convents established, 5-245.
Nureddin, Nurreddin, or Nur-ed-din [noor ed-din], **Mahmud'** (1116-74), sultan of Syria and Egypt, 6-488.
Nuremberg. Tn. in Bavaria, Germany; pop. 362,459; 5-476; Nazi rally, 4-11 illus.; watchex, 1-387; war crimes tribunal, 5-476, 4-160.
Nurmi, Paavo (b. 1897). Finnish athlete; one of the greatest long-distance runners of all time. Estab. world records for mile, 1923; 2 miles, 1931; 5 miles, 1924; 6 miles, 1930; won 6 Olympic titles.
Nurse Hound. Type of shark, 7-18 illus.
Nursery Rhymes, 5-476, 177 with illus.; Hindu origin of many, 4-250.
Nursing, 5-485; careers in, 2-238, child-care as a career, 2-234. Florence Nightingale and, 5-137, in Pakistan, 6-42 illus.; Red Cross, 6-370.
Nut-galls. Source of mfr., 4-261, 262 illus.
Nuthatches and Creepers. Birds, 5-486; eggs, 1-452 illus. f.
Nutmeg and Mace. Spices, 5-486, 7-131 illus.
Nutrition, what our bodies need, 3-109.
Nuts, 5-486; botanically defined 2-24; protein in, 6-297. See also individual nuts by name.
Nux Vomica [nuks vom'ika], poisonous seed of an E. Indian plant, yielding strychnine.
Nyas [nyas], Lake on r. boundary of Nyasaland; 11,200 sq. m.; discovered by Livingstone, 4-527.
Nyasaland. Part of Central African Federation; area 37,374 sq. m.; pop. over 2,000,000; 6-395, 1-53.
Nylon. A plastic material used in textile mfr., 5-487, 6-220; nylon lace, 4-433; ropes, 6-153, 5-284.
Nymph. Young insect which resembles its parents when hatched, 4-269.
Nymphs, in Gk. myth., 5-488.
Nyrina. Amazon queen, and the Gorgons, 1-130.
Nystadt, Finland, small port on Gulf of Bothnia, 40 m. N.W. of Turku, peace signed between Russia and Sweden (1721).



As far back as we can trace the letter Q, it has undergone little change. Its first appearance seems to be in the Phoenician alphabet as a slightly irregular circle. It was supposed to represent an eye and was called *ayin*, the Phoenician word for "eye." In the Greek alphabet are two Q characters, great Q (*omega*, Ω) and little Q (*omicron*, O), but originally there was only one. Such departures from the perfect circle as we find in ancient inscriptions were due to the difficulty of inscribing a

circle on stone. Thus sometimes its form is that of an ellipse, sometimes it is square, and sometimes it is nearly a diamond. The form of the letter suggests its pronunciation. The sound of "long" Q is pronounced while the mouth is rounded, and the back part of the tongue is raised and somewhat rounded. In English Q has many uses, alone and in combination with various sounds, for example, in *not, post, move, love, women, woman, book, brood, owl, bowl, rough, out, ought, soul, boat, broad*.

Oahu. Isl. of Hawaii; Honolulu stands on it; attack on Pearl Harbour, 6-100, 4-140, 4-139.
Oaxaca. See **Oaxaca**.
Oak. Tree, 5-489, 7-314 illus.; sacred to druids, 3-128; wood used in furniture, 3-491; and Golden Bough legend, 3-162.
Oak Apple Day, Charles II and, 5-489.
Oak Apples, how formed, 5-489, 490 illus.
Oak Eggar moth, 2-144 illus.
Oak-galls, a big growth of the surface tissues of the oak brought about by gall-wasps; oak-galls are used in dyeing, and as base of high-grade inks, 4-261.

Oakham. Co. tn. of Rutland, Eng., 95 m. N.W. of London; boot and shoe mfrs.; boy's public school; pop. 3,537; 6-482.
Oakland, Calif., U.S.A. Residential and industrial city on San Francisco Bay, connected to San Francisco by world's longest bridge; pop. 381,575; shipping centre for agric. and fruit-growing region, 2-177.
Oakley, Olly (1879-1943). Banjo player; and banjo music, 1-361.
Oak Moss. Vegetable fixative used in perfumes, 6-124.
Oak Ridge. Site of atomic research centre in Tennessee valley, U.S.A., 1-303, 7-256.

Oaks, The. Horse-race run at Epsom on Friday of Derby week, 4-198.
Oakum. Loose hempen fibre made from old ropes, used for caulking seams between planks and for stopping leaks in ships. Oakum picking was formerly a common employment in prisons and workhouses.
Oarweed. Type of brown seaweed agar-agar made from, 1-104, 105.
Oasis [ō'is], fertile spot in desert 3-78; in Algeria, 1-108 illus.
Oast-houses. Hop drying kilns, 4-192 illus.
Oastler, Richard (1789-1861). Brit reformer; called "The Factory King," because of energetic advu

- cacy of the factory-worker's cause; with Lord Shaftesbury and others he worked for child-labour laws.
- Oates, Lawrence Edward Grace** (1880-1912), Brit. army officer and polar explorer; heroism on Scott's last journey, 6-516, 517 illus.
- Oates, Titus** (1649-1705). Eng. conspirator who falsely accused Roman Catholics of a "popish plot" (1678-80) to restore Roman Catholicism and Judge Jeffreys, 4-359.
- Oatmeal**, 5-490.
- Oats**. A cereal crop, 5-490; harvest, 4-134; protein in, 6-297; rust fungus, 6-181 illus.
- Oaxaca** [wahhah'kah] or **Oajaca**, Mexico, state in s. of Isthmus of Tehuantepec, on Pacific; 36,000 sq. m.; pop. 1,192,800; cap. Oaxaca, pop. 36,000; produces sugar, coffee, cotton, coal.
- Ob** or **Obl**, great navigable r. of w. Siberia, rising in West Siberia flows N.W. and S. 2,500 m. to Gulf of Ob, bay of Arctic Ocean; chief tributary, Irtysh, 6-172, 1-268, 7-48.
- Obadiah** [obad'ah] (6th cent. B.C.). Hebrew minor prophet, author of the 31st book of the Old Testament, which bears his name.
- Oban**. Spt. and holiday resort of Argyllshire, Scotland; pop. 6,227.
- Obligato**. See **Musical Terms** (list).
- Obelisk**, a four-sided tapering shaft with a pyramid top, a favourite form of monument of the anc. Egyptians, Cleopatra's Needle, 2-108, 109 illus.
- Oberammergau**. Village in Upper Bavaria, Ger.; famous for Passion Play, 5-490, 1-388.
- Oberhausen** [ob'berhauzen] Germany. Mfg. tn. in Ruhr, 35 m. N. of Cologne; pop. 191,300. iron and chemical works, 6-168.
- Oberon**. Fairy king in Shakespeare's *A Midsummer Night's Dream*, 5-200.
- Obesity**, danger of, 3-410.
- Obl**. See **Ob**.
- Object**, in grammar, 7-390.
- Oboe**. A wood-wind instrument, 7-473.
- Obovate**. Bot. term given to type of leaf which is broader near the upper part, 4-171.
- Obrénovich** [ob'ra-nóvich]. A ruling Serbian family; held power (not continuously) from accession of Milosh Obrénovich to assassination of Alexander (1903).
- Obrénovich, Milosh** (1780-1860). Serbian leader who succeeded Kara George as ruler of Serbia, 6-532.
- Observatory**, astronomical, 5-493.
- Obsidian**. Glassy volcanic rock, 4-156. See also **Stones, Precious** (list).
- Obverse**, of coin, 5-224.
- O'Casey, Sean** (b. 1881). Irish dramatist; *Junó* and *The Playboy* were awarded the Hawthorned Prize in 1926; other plays are *The Plough* and *The Stars, The Silver Tassie* 4-287, 3-122.
- Occulting Lights**, of lighthouse, 4-502.
- Occupations**. See **Careers**.
- Ocean**, 5-494; effect on earth's climate, 3-150, 7-424, 425; Antarctic Ocean, 5-491, 1-181; Arctic Ocean, 1-220; Atlantic Ocean, 1-292, 5-491; continental shelf, 6-186; Gulf Stream, 4-105; icebergs, 4-229; marine life, 5-127; physiography, 6-188; salt from sea-water, 6-491; temperature, 5-498; tides, 7-274; waterspout, 7-430; winds, 7-457.
- Ocean Currents**, types of, 5-498.
- Oceania**. Isls. of Pacific Ocean divided into Polynesia, Micronesia, Melanesia. See also **chief isls.** and **groups** by name.
- Oceanic**. White Star liner built in 1870, 7-38 illus.
- Oceanids**. In Gk. myth., sea nymphs, daughters of Oceanus, 5-488.
- Ocean Mirage**, 5-224.
- Oceanography**. The science of ocean phenomena, includes hydrographic surveying; researches on ocean bed, 5-498.
- Oceanus** [os'e'anus]. In Gk. myth., eldest of the Titans, personification of the all-encompassing ocean.
- Ocelli**, simple eyes of insects, 4-264.
- Ocelot**, a leopard-like cat, 4-184, 2-263.
- O'chil Hills**. Hill range of Scot., chiefly in Perthshire, but extending into Clackmannan, Fife, and Kinross counties, 2-405, 4-412, 6-510.
- Ochre** [ó'ker]. A yellow or reddish-brown clay, containing oxide of iron, used as a pigment, 6-38.
- O'Connell, Daniel** (1775-1847). Irish lawyer and political leader, 5-499.
- O'Connor, Thomas Power** ("Tay Pay") (1848-1929). Irish Nationalist leader and journalist; entered parl. 1880; founded and edited *The Star*, *T.P.'s Weekly*, etc.
- Octane**. Volatile hydrocarbon oil of the paraffin series, 2-319; models of organic molecules, 2-320 illus.
- Octave**. In music, the 8th full tone above or below any given note; also the interval between a note and its octave.
- Octavia** (A.D. 12-62). Rom. empress, wife of Nero.
- Octavia** [oktá'via] (d. 11 B.C.). Sister of Rom. emperor Augustus, and wife of Mark Antony; head, 6-441 illus.
- Octavian** (originally Gaius Octavius). Family name of Augustus Caesar. See **Augustus**.
- Octavo** (8vo), size of book, 2-1; see also **Paper Sizes** (list).
- October**, 10th month of the year; in Rom. calendar, 5-255.
- October Revolution**, Russia (actual date Nov. 7, 1917), and Old Style calendar, 2-175.
- Ocotopus**. Sea creature of the class *Cephalopoda*, 3-13 with illus., 5-128, 1-155; movement by water jet propulsion, 4-370; egg-laying, 3-172.
- Ode** [ód]. A form of stately and elaborate lyric poetry; originally a poem intended to be chanted or sung, 6-235.
- Odense** [ó'thensá]. 3rd city in Denmark, on isl. of Funen at mouth of r. Odense; pop. 92,136; cathedral, 3-74 illus.
- Ode on a Grecian Urn**. Poem by Keats, 4-395.
- Oder** [ó'der]. Important r. of Ger., rises in N.-cent. Czechoslovakia, flows N.E. 560 m. and enters Baltic by 3 arms; in 2nd World War, 7-496.
- Oder-Neisse line**. Germany's eastern frontier settled by Potsdam Agreement, 1945. Poland to occupy Ger. east of river Oder and Neisse, pending settlement of claims against Ger. in peace treaty, 4-3.
- Odessa**. Chief port of the Ukrainian S.S.R., pop. (1939) 601,200, 5-499, 6-172.
- Odets, Clifford** (b. 1906). Amer. playwright; plays include *The Golden Boy* (1937), *The Big Knife* (1949), *Winter Journey* (1950).
- Odin or Woden**. In Norse myth., father of the gods, 5-500, 7-270.
- O'do or Eudes** (d. 898). King of the Franks, crowned 888; fought Normans and his rival Charles III for Fr. throne.
- Odo** (c. 1036-97). Half-brother of William the Conqueror; Bishop of Bayeux, Fr.; died on 1st Crusade; as vassal of William, 3-348; and Bayeux Tapestry, 1-389.
- Odoacer** [ó'doá'ser] (c. 435-493). Ger. leader who overthrew the Western Rom. Empire, 6-439; defeat by Theodoric, 4-49.
- Odonata** (Zool). Order of insects including dragon-flies, 1-270.
- Odontoglossum**. One of the genera of orchids most frequently grown in hothouses.
- Odysseus**. In Gk. myth., king of Ithaca and Trojan War hero; his adventures, 5-500; and Achilles, 1-10; and Ajax, 1-87; and Ulysses, 2-402; in Homer's *Odyssey*, 4-189; the Trojan War, 7-320.
- Odyssey**, The. Gk. epic poem attributed to Homer, relating the adventures of Odysseus (Ulysses), 4-189; story of Ulysses, 2-402; historical origins, 4-72; Latin translation, 4-119.
- Oea**, Roman city in N. Africa; Tripoli on same site, 1-53.
- Oedipus**. In Gk. myth., king of Thebes, 5-505; and the Sphinx, 7-131.
- Oeffentliche Wissenschaftliche Bibliothek**, library, Berlin, 4-487.
- Oenone** [éonón]. In Gk. myth., river nymph, wife of Paris.
- Oerlikon** anti-aircraft gun, 1-174.
- Oersted** [er-'sted] or **Oersted, Hans Christian** (1777-1851). Danish physicist, established connexion between electricity and magnetism, 5-275, 5-84, 3-210.
- Oersted**. The centimetre-gram-second unit of magnetism or magnetic force.
- Oesophagus** [esof'agus], or **Gullet**, muscular tube from mouth to stomach, 1-141, 3-90, 89 diag.
- O'Faolain** [ofaw'len], **Sean** (b. 1900). Irish writer; novels *Midsummer Night Madness*, *A Nest of Simple Folk*; biographies, *Constance Markievicz*, *The Great O'Neill*.
- O'fla** (d. 796). King of Mercia; defeated Wessex and the Welsh, wresting part of territory from the latter and building great fortifications along whole border between Eng. and Wales now called "O'fla's Dyke," 7-15.
- O'flaly**. Co. of Irish Rep., formerly King's County; area 772 sq. m.; pop. 52,555. Tullamore is co. tn.
- Offenbach** [of'enbakh], **Jacques** (1819-80). Fr. composer, originator of opéra bouffe, b. Ger. (*Tales of Hoffmann*), 5-529.
- Office Management**, as career, 2-238.
- Officer**. Anyone serving under a commission granted by the sovereign in the Services; in the army a man is either a soldier (private, etc.) or an officer; there are also warrant-officers and non-commissioned officers. See under various ranks.
- Officers' Training Corps**. See **Junior and Senior Training Corps**.
- Official Receiver**. Public official who manages the affairs of persons who become bankrupt or of companies which go into liquidation, 1-363.
- Offset Lithography**. Printing process, 4-523, 6-294.
- Off-side**, rule in football, 3-115; rule in hockey, 4-181.
- Ofag**, abbreviation of Ger. *Offizier-lager*. Ger. prisoner-of-war camp for officers.
- O'Flaherty** [ó'flah'ertli], **Liam** (b. 1897). Irish author; works include *The Informer* (James Tait Black Prize); *Famine*; *Life of Tom Healy*; 4-287 illus.
- Ogbornosho**. Tn. in Nigeria, W. Africa; pop. 139,000; 5-155.
- Ogden, C. K.** (b. 1889). Brit. scholar and teacher of languages; with I. A. Richards invented Basic English (q.v.).
- Ogee** [ó'je] or **Ogive** (ó'jiv), in architecture, a wave-like moulding, with an inner and outer curve.
- Oglethorpe, James Edward** (1696-1783). Eng. soldier and philanthropist, founded Georgia, U.S.A.
- O.G.P.U.** Its secret police. See **M.V.D.**
- O'Higgins, Bernardo** (1778-1812). Chilean patriot and defector, leader in war for independence; 2-360.
- Ohio**. State of U.S.A.; area 44,222 sq. m.; pop. 7,916,627; cap. Columbus; 5-508.
- Ohio River**, 5-508, 4-236.
- Ohm** [ón], **Georg Simon** (1787-1854). Ger. mathematician and physicist; ohm, unit of electrical resistance, named after him; Ohm's law, 3-211.
- Ohm**. The unit of resistance to the passage of an electric current. The international ohm is that degree of resistance offered, at the temperature of melting ice, to an unvarying electric current, by a column of mercury 14-521 grams in mass, of uniform cross-sectional area and 106-300 centimetres in length, 3-211.
- Ohm's Law**. Law governing the flow of a steady current in an electric circuit. It states that the voltage drop produced by the current is proportional to the magnitude of the current. For an electrical pressure of E volts and a current I of one ampere, the resistance, R , in ohms, is equal to E/I , 3-211.

OICH

Oiah, Loch. Lake of Inverness-shire, Scot.; trout and salmon fishing; 4-275.

Oil. See Petroleum for mineral oils; Oils and Fats for vegetable oils.

Oil-sake. Seeds from which oil has been pressed.

Oilcloth. Waterproof covering for tables, shelves, etc., made from cotton cloth coated with oil paint. Ward also commonly used for floor-cloth and linoleum.

Oil Derrick. 6-151 illus.

Oil's, openings or loopholes made in the battlements and walls of medieval fortifications so that arrows could be shot at besieging parties.

Oil of Lavender, used in perfume, 4-457.

Oil of Turpentine. The crude product freed of resin and refined by distillation, 3-38.

Oil of Vitriol, 7-187.

Oil Paint, mixed oil in, 6-37.

Oil Painting, 6-36.

Oil Pipelines, at Kuwait, 6-152 illus. f. trans-Arabian pipeline, 6-151.

Oil Pressure Gauge, in motor vehicle, 5-282.

Oil Refinery, 6-151; at Dunkirk, 3-487 illus.; at Fawley, 6-152, 7-101.

Oils and Fats, 5-506; aromatic oils in spices, 7-132; distillation of, 5-94; as energy foods, 3-410, 411; hydrogenation, 4-232; in soap, 7-80; from soybean, 7-103.

Oil Stove, for heating, 4-149.

Oil Tanker, capacity, 6-151.

Oil Tanning. Method of tanning chamois leather, 4-469.

Oil Wells, drilling of, 6-148; drill-pipe, 6-149 with illus.

Oise (wahz). R. of N. Fr., rises in s.w. Belgium; flows s.w., receiving Aisne at Compiègne and joins Seine, 15 m. n.w. of Paris; length 187 m.; important strategic line in 1st World War; 6-530.

Oisin (Iachle bard). See *Osian*.

Ojibwa or Chippewa Indians. Large and important Algonquin tribe once living about upper Great Lakes and extending W. into Minnesota, U.S.A.; art, 6-373 illus. f.

Ojos del Salado. Chilio. Highest mt. in W. hemisphere (23,293 ft.), 7-96.

Oka (ôkah). R. of cent. Russia; though rapid, is navigable for almost entire length of 950 m.; joins Volga.

Okanagan. Fruit-growing dist., river and lake in s. British Columbia; lake 89 m. long, 2-4 m. wide, 2-81 illus.; river, 115 m. long, issues from s. end of lake, enters U.S. (Washington), and joins Columbia R. (U.S. sp. Okanogan).

Okapi (ôkah'pi). Ruminant related to giraffe; native to Central Africa.

Okeechobee, Lake, Florida, U.S.A.; area, 717 sq. m., 3-303.

O'Kelly, Sean T. (b. 1883). Irish statesman; with A. Griffith founded Sinn Féin party; fought in Easter Rising, 1916, and consequently imprisoned; later held various govt. offices; became 2nd president of Irish Republic, 1945.

Okhotsk, Sea of, as arm of Pacific Ocean, 6-26.

Okinawa. Largest isl. of Ryukyu group, Pacific Ocean, 325 m. from Jap mainland, and belonging to Japan before 2nd World War; area 485 sq. m.; Jap air base, captured by U.S. troops in 1945; retained by U.S.A. as base after end of war, 7-498.

Oklahoma. State of U.S.A.; area 69,919 sq. m.; pop. 2,223,351; cap. Oklahoma City; 5-506.

Oklahoma City. Cap. of Oklahoma, U.S.A.; pop. 243,501; oil refining chief industry; 5-507.

Okyo (1733-95). Jap. artist; characteristics of work, 4-353.

Olaf I, Torgvesson (969-1000). King of Norway; began Christianisation of Norway; leaped into sea after defeat by Danes and Swedes; heroic deeds recounted in Longfellow's "Saga of King Olaf."

Olaf II, St. (995-1030). King and patron saint of Norway; gained the throne in 1016; united kingdom and continued its Christianisation.

Olaf (b. 1903). Crown Prince of Norway, son of Haakon VII.; married Princess Martha of Sweden in 1929.

Oland (ô'lahnt). Swedish isl. in Baltic Sea across Kalmar Sound from s.e. extremity of Sweden; 619 sq. m.; cap. Borgholm on w. coast; pop. 130,000.

Old Bailey. London street, at the N. end of which is the Central Criminal Court, popularly called "the Old Bailey," 2-521.

Old Castle, Sp. N. part of Castile, an elevated plateau walled in by mountains.

Old Comedy. In Gk. drama, 3-116.

Old Crooks Race. Annual old car race between London and Brighton, 6-413.

Oldenburg (ô'ldenboorg). Part of the Land of Lower Saxony, W. Ger.

Old English or Anglo-Saxon language. 3-282.

Old English Literature, 3-283.

Oldfield, Anne ("Nance") (1683-1730). The most brilliant actress of her time; played both comedy and tragedy rôles, among her successes being *Jane Shore* and *Lady Jane Grey*.

Old Guard. Popular name of noted body of troops in army of Napoleon I; made last Fr. charge at battle of Waterloo.

Oldham. Important cotton mfg. tn. in Lancashire, 6 m. N.E. of Manchester; pop. 121,210; 3-249, 4-444.

Old Lady of Threadneedle Street. Name given to Bank of England, 1-362 illus.

Old Man of the Mountains, The. See *Haasan ibn Sabbah*.

Old Man of the Sea. In "Arabian Nights," the little old man who beguiled the Sailor to carry him across a brook and then will not be dislodged from his back; term hence used for anything which, however lightly undertaken, has become a continuous and troublesome burden.

Old Man's beard. Form of tree-lichen, 4-190 illus.

Old Moore's Almanac. Annual astrological publication, originating as Francis Moore's *Vox Stellarum* (1700), 1-117.

Old Pretender. See *James (James-Edward Francis Stuart)*.

Old Sarum. Parish in Wilts, Eng., 2 m. N. of Salisbury; former city, deserted by 16th cent., elected M.P.s as "rotten borough" until 1832.

Old Shoreham bridge, over R. Adur, Sussex, 2-62 illus.

Old Stone Age. See *Paleolithic Age*.

Old Style Calendar (Julian calendar). retained by Gt. Brit. till 1752, 2-175.

Old Testament of Bible, 1-440; language of, 4-151; the prophets, 6-296.

Old Trafford. Famous cricket ground at Manchester, 5-112.

Old Vic. Famous London theatre in Waterloo Rd., S.E.1. Opened 1818 as The Coburg, later became the Royal Victoria Hall, nicknamed the Old Vic. Under Lillian Baylis Shakespearean drama was produced from 1914. Damaged by bombs, 1940, restored and reopened in 1950.

Old Windsor. Village in Berks, Eng., about 2 m. S.W. of Windsor. Here Edward the Confessor (c. 1005-66) had a palace, 7-160.

Oleaceae (ô'leasîc) or Olive family. Plant family including olives and lilacs, ash and privet; distributed over temperate and tropical regions.

Oleanther. Flowering shrub of order *Apocynaceae*, found in Mediterranean countries; lance-shaped leaves and clusters of rose-like flowers.

Oleander Hawk moth, 2-142 illus.

Olein (ô'lein). Compound found in fat and oils.

Oléron. Fertile isl. off W. coast of Fr. at mouth of r. Charente; included in dept. of Charente-Inférieure; 66 sq. m.; chief tn. St. Pierre.

Olevano Romano. Tn. in Italy, 4-314 illus.

Oligarchy (ô'lîgahki). Form of govt. in which power is held by small group.

OMAR, MOSQUE OF

Oligocene Period. In geology, 3-515, 516.

Oliphant, Marcus L. E. (b. 1901). Australian physicist; prof. of physics at Birmingham, 1937; researched on electricity in gases, and nuclear physics; helped develop the atomic bomb.

Olive. Tree from which oil and olives are obtained, 5-507; Athens legend, 1-286.

Olive Oil, 5-508; used by Gk. athletes, 6-183.

Oliver, Isaac (d. 1617). Eng. miniature, 3-258.

Oliver of Malmesbury. Inventor of a flying machine in 1020, 1-27.

Olives, Mount of. Historic ridge E. of Jerusalem; favourite resort of Christ and Disciples; contains "Hill of Olives," reputed scene of Solomon's idolatry.

Olivier, Sir Laurence Kerr (b. 1907). Brit. actor and producer. Stage successes include *Romeo and Juliet Hamlet, Henry V., Macbeth*; productions include screen version of *Henry V.* when he achieved international fame in 1944 as director and star; directed and played lead in film of *Hamlet*, 4-123; knighted 1947; married Vivien Leigh, herself a well known actress.

Olivin. Volcanic rock, source of asbestos; occurrence and working of 1-262.

Olivine. See *Stones, Precious (list)*.

Olney, Th. in Bucks, Eng., 12 m. S. of Northampton; William Cowper the poet lived here; pop. 2,400, 2-105; Olney Hymns, 2-522, 4-226.

Olmouze or Olmutz, Czechoslovakia Moravian tn. on r. March; coal mining; pop. 61,240; occupied by Swedes in Thirty Years' War, besieged by Frederick the Great (1758); conference to settle Prussian affairs (1850).

Olsztyn. Prov. of Poland, formerly E. Prussian Masuria; area 12,000 sq. m.; pop. (1939) 1,500,000.

Olsztyn. Tn. of Poland, formerly Allenstein (*q.v.*).

Olténitza (ôltânîc'za). Rumania. Tn. on Danube; Turks defeated Russians in Crimean War; large grain and lumber trade.

Olympia, Greece. Plain in anc. Elis on r. Alpheus (modern Ruphan); scene of Olympic Games; temple of Zeus, 5-508, 4-74 illus.

Olympia. Cap. of state of Washington, U.S.A.; pop. 15,819; 7-123.

Olympiad. Four-year period between the Olympic Games, used by anc. Greeks for dating events, 5-510.

Olympias (d. 316 B.C.). Epirote princess, wife of Philip II of Macedonia and mother of Alexander the Great.

Olympic Games, 5-508; in anc. Greece, 4-71; crown of olives, 5-507; how flame is lit, 3-356. See also table of results, opposite Athletics.

Olympus, Mt., ridge in N. Greece, separating Thessaly and Macedonia; fabled home of gods, 1-350, 7-322; name also applied in anc. times to several other peaks, especially one in Asia Minor.

Omagh. Co. tn. of Tyrone, Northern Ireland; pop. 6,762, 7-342.

Omaha. Largest city in Nebraska, U.S.A.; pop. 251,117; on Missouri; rly. workshops, smelting, and meat-packing industries, 6-360.

Oman, Sir Charles (1860-1946). Brit. writer and historian; prof. of mod. hist., Oxford University, 1905-1946.

Oman (ô'mân). Independent state of s.e. Arabia on Persian Gulf, Gulf of Oman, and Arabian Sea; 82,000 sq. m.; pop. 500,000, chiefly Arabs; exports dates; cap. Muscat; 1-190.

Oman, Gulf of. Arm of Arabian Sea 4 of Persia; connected with Persian Gulf by Strait of Ormuz; 6-134.

Omar (ô'mahr) (c. 581-644). 2nd Mahomedan caliph, organizer of Mahomedan power from warring sect to empire.

Omar, Mosque of, Jerusalem. Built over rock supposed by Jews to be

OLYMPIC GAMES—RESULTS 1952 (Helsinki)

Athletics (Men)

		H.	M.	S.
100 Metres	L. Remigino, U.S.A.	10	1	1
200 Metres	A. Stanfield, U.S.A.	20	7	5
400 Metres	V. G. Rhoden, Jamaica	45	7	5
800 Metres	M. G. Whitfield, U.S.A.	1	49	4
1,500 Metres	J. Barthel, Luxemburg	3	45	1
5,000 Metres	E. Zatopek, Czechoslovakia	14	0	1
10,000 Metres	E. Zatopek, Czechoslovakia	20	17	5
110 Metres Hurdles	H. Dillard, U.S.A.	13	7	5
400 Metres Hurdles	C. Moore, U.S.A.	5	0	9
3,000 Metres Steeplechase	H. Aschenfeiter, U.S.A.	8	45	1
400 Metres Relay	U.S.A.	3	40	1
1,000 Metres Relay	Jamaica	3	3	7
10,000 Metres Walk	J. P. Mikaelson, Sweden	45	2	1
50,000 Metres Walk	G. Dordoni, Italy	4	28	7
Marathon	E. Zatopek, Czechoslovakia	2	23	3

		FT.	IN.
High Jump	W. F. Davis, U.S.A.	6	8
Long Jump	J. C. Biffle, U.S.A.	24	10
Hop, Step, and Jump	A. F. da Silva, Brazil	53	2
Pole Vault	R. Richards, U.S.A.	14	11
Putting the Weight	W. P. O'Brien, U.S.A.	57	1
Throwing the Discus	S. Iness, U.S.A.	180	0
Throwing the Javelin	C. Young, U.S.A.	242	0
Throwing the Hammer	J. Csernak, Hungary	197	11
Decathlon	R. B. Mathias, U.S.A.		
Modern Pentathlon	L. Hall, Sweden		

Athletics (Women)

		H.	M.	S.
100 Metres	M. Jackson, Australia	11	1	1
200 Metres	M. Jackson, Australia	23	7	5
50 Metres Hurdles	S. B. Strickland, Australia	10	7	0
400 Metres Relay	U.S.A.	45	1	0

		FT.	IN.
High Jump	E. Brand, S. Africa	5	5
Long Jump	Y. Williams, N. Zealand	20	5
Putting the Weight	G. Zybina, U.S.S.R.	50	1
Throwing the Javelin	D. Zatopkova, Czechoslovakia	105	7
Throwing the Discus	N. Romaschikova, U.S.S.R.	168	8

Boxing

Flyweight	N. Brooks, U.S.A.
Bantamweight	P. Hamalainen, Finland
Featherweight	J. Zachara, Czechoslovakia
Lightweight	A. Bolognesi, Italy
Light-welterweight	C. Adkins, U.S.A.
Welterweight	Z. Chychyla, Poland
Light-middleweight	L. Papp, Hungary
Middleweight	F. Patterson, U.S.A.
Light-heavyweight	N. Lee, U.S.A.
Heavyweight	E. Sanders, U.S.A.

Cycling

		H.	M.	S.
1,000 Metres Time Trial	R. Mockridge, Australia	1	11	7
4,000 Metres Team Pursuit	Italy	4	46	0
Road Race	A. Noyelle, Belgium	5	6	3
1,000 Metres Scratch	E. Sacchi, Italy			
2,000 Metres Tandem	L. Cox and R. Mockridge, Australia			
Road Race (Team)	Belgium			

Fencing

Epee (Individual)	E. Mangiarotti, Italy
Epee (Team)	Italy
Foils (Individual)	C. d'Orsola, France
Foils (Team)	France
Sabres (Individual)	P. Kovacs, Hungary
Sabres (Team)	Italy
Foils (Women)	I. Camber, Italy

Gymnastics

Team (Men)	U.S.S.R.
Individual	V. Tchoukarine, U.S.S.R.
Team (Women)	U.S.S.R.

Hockey

Association Football	Hungary
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Basketball

Water Polo	Hungary
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Rowing

		M.	S.
Sculls (Single)	U.S.S.R.	8	12
Sculls (Double)	Argentina	7	32
Pairs (Coxed)	France	5	25
Pairs (Coxless)	U.S.A.	8	20
Fours (Coxed)	Czechoslovakia	7	33
Fours (Coxless)	Yugoslavia	7	10
Eights	U.S.A.	6	25

Shooting

Free Pistol (50 Metres)	H. Benner, U.S.A.
Rapid Fire Pistol (25 Metres)	H. Takacs, Hungary
Free Rifle (300 Metres)	A. Bogdanov, U.S.S.R.
Clay Pigeon	G. Genereux, Canada
Small Bore Rifle (Prone)	I. Sarbu, Rumania
Free Rifle (50 Metres)	E. Kongshang, Norway
Running Deer	J. Larsen, Norway

Swimming (Men)

		M.	S.
100 Metres Free Style	C. Scholes, U.S.A.	1	57
200 Metres Breast Stroke	J. Davies, Australia	2	31
400 Metres Free Style	J. Bolteux, France	4	30
100 Metres Back Stroke	Y. Oyakawa, U.S.A.	1	56
1,500 Metres Free Style	F. Konno, U.S.A.	18	30
800 Metres Relay	U.S.A.	8	31

Swimming (Women)

100 Metres Free Style	K. Szoke, Hungary	1	04
200 Metres Breast Stroke	E. Szekely, Hungary	2	51
400 Metres Free Style	V. Gyenge, Hungary	5	12
100 Metres Back Stroke	J. Harrison, S. Africa	1	14
400 Metres Relay	Hungary	4	24

Diving

Highboard (Men)	S. Lee, U.S.A.
Highboard (Women)	P. McCormick, U.S.A.
Springboard (Men)	D. Browning, U.S.A.
Springboard (Women)	P. McCormick, U.S.A.

Weight Lifting

Bantamweight	I. Udodov, U.S.S.R.
Featherweight	R. Chmishkyan, U.S.S.R.
Lightweight	T. Kono, U.S.A.
Middleweight	P. George, U.S.A.
Light-heavyweight	T. Lonakhi, U.S.S.R.
Middle-heavyweight	N. Schemanski, U.S.A.
Heavyweight	J. Davis, U.S.A.

Wrestling (Freestyle)

Flyweight	H. Gemel, Turkey
Bantamweight	S. Ishii, Japan
Featherweight	B. Sit, Turkey
Lightweight	O. Anderberg, Sweden
Welterweight	W. Smith, U.S.A.
Middleweight	D. Cinakuridze, U.S.S.R.
Light-heavyweight	B. Palm, Sweden
Heavyweight	A. Mekokishvili, U.S.S.R.

Wrestling (Greco-Roman)

Flyweight	B. Gourevich, U.S.S.R.
Bantamweight	I. Hodas, Hungary
Featherweight	J. Pounkine, U.S.S.R.
Lightweight	C. Saffin, U.S.S.R.
Welterweight	M. Szilvasi, Hungary
Middleweight	R. Groenberg, Sweden
Light-heavyweight	K. Groendahl, Finland
Heavyweight	I. Kotkas, U.S.S.R.

Yachting

6-Metre Class	U.S.A.
Dragon Class	Norway
Star Class	Italy
5-5-Metre Class	U.S.A.
Finn Class	Denmark

Riding

Individual Dressage	Sweden
Team Placing	Sweden
Three-Day Event (Individual)	Sweden
Three-Day Event (Team)	Sweden
Prix des Nations (Individual)	France
Prix des Nations (Team)	Great Britain

OMAR KHAYYAM

scene of the sacrifice of Isaac and, by Mahomedans, that of the Prophet's ascension.

Omar Khayyam (d. c. 1123). Persian poet, astronomer and mathematician; author of *Rubaiyat*; 5-511.

Omayyads [om'adz], or **Umayyads**. Dynasty of caliphs or successors of Mahomet who asserted rule over Mahomedan empire from death of Ali, 4th caliph, to rise of Abbasids (661-750), and ruled in Spain (756-1031).

Omdurman [omdoormahn']. City on Nile, Sudan, opposite Khartum; pop. 116,200; ivory, ostrich feathers, gum-arabic; battle of, 4-115.

Omega, ω , Ω . Twenty-fourth and last letter (long o) of Gk. alphabet.

Omicron, \omicron , \circ . Fifteenth letter (short o) of Gk. alphabet.

Omnibuses. See **Omayyads**.

Omnibus. Passenger transport vehicle; horse bus, 6-412; steam bus, 6-413; 412 illus.; motor bus, 6-414; centre of gravity, 5-159.

Omsk. City of Russia; distributing point for w. Siberia, on Irtysh r. and Trans-Siberian Rly.; pop. 281,000.

Omtape. Active volcano forming an island in Lake Nicaragua, 5-430 illus.

Ona Indians. Tribe of S. Amer. Indians, 7-98.

Onandagas. Amer. Indian tribe, 5-421.

Onega, Lake. In s.w. Russ., 2nd largest l. in Europe; 3,700 sq. m.; indented rocky shores; outlet to White Sea, canal connexion with Volga and Dvina; fisheries, timber trade.

Oneldas. Amer. Indian tribe, 5-421.

O'Neill, Eugene (1888-1953). Amer. playwright; his plays, mystical in outlook, include *The Emperor Jones*, *Anna Christie*, *Strange Interlude*, and *Mourning Becomes Electra*; 7-368.

On First Looking into Chapman's Homer. Sonnet by Keats, 4-395.

Onion. Plant of the *Liliaceae* family, 5-511; onion juice as invisible ink, 4-262.

Onitsha. Tn. in Nigeria, W. Africa; pop. 77,000; 5-435.

Onnes, Heike Kamerlingh (1853-1926). Dutch physicist, winner of Nobel prize for physics in 1913; low temperature experiments.

Onomatopoeia, in language, 4-415.

Ontario. Prov. of Canada; area 412,582 sq. m.; pop. 4,597,542; cap. Toronto; 5-512, 2-83.

Ontario, Lake. Smallest of Great Lakes, 7,510 sq. m.; 4-68; map, 4-69; and Niagara r., 5-129.

Onyx. A coloured variety of quartz, 6-320, 7-353, 7-161. See also **Stones**, **Precious** (list).

Onyx Marble. Variety of marble, 5-121.

Oolite Limestone, 4-509.

Oolite Period, in geology, a period when the continents of Europe and Asia were to a large extent covered by the ocean. Oolite deposits are chiefly limestone, rich in fossil remains of marine animals.

Oospore. Fertilised egg-cell in primitive plants.

Opal. A precious stone, cause of iridescence, 2-163. See also **Stones**, **Precious** (list).

Opava or Troppau [trô'pow], Czechoslovakia. Former cap. of Austrian Silesia, on Oppa; pop. 30,105; makes cloth, beet sugar, machinery.

Openast Mining, 5-218; of coal, 2-430.

Open-door Policy. Term used in international politics to designate equality of commercial opportunity to all nations.

Open Field or Strip System, in farming, 1-72, 70 diag.

Open-hearth Furnaces, in steel-making, 4-294, 3-490, 4-291 illus.

Opera. A music-drama, 5-513; Gilbert and Sullivan, 4-20, 21. Italian opera, 5-303; leitmotif in, 7-409; singing, 7-58. Wagner, 7-408, 409.

Opéra bouffe, 5-514.

Opéra comique, 5-514.

Opera glass, 7-250.

Operating Theatre, asepsis in, 1-177.

Ophicleide. Early horn instrument, 5-309.

Ophideres Fullonica, moth, 2-112 illus.

Ophidia. Zool. order of snakes, 6-388.

Ophthalmic Surgery, 7-195.

Opie, John (1761-1807). Brit. painter; became known as the "Cornish Wonder" for his portraits and somewhat theatrical historical compositions.

Opitz, Martin (1507-1639). Ger. poet; head of so-called First Silesian School; called "father of modern German poetry."

Opium. Drug prepared from the opium poppy, 5-521, 3-127; drug-taking in China, 2-373; as an anæsthetic, 1-112.

Opium Poppy, opium from, 6-260.

Opium War (1839-40). Fought between Gt. Britain and China, 2-373, 5-521.

Oporto [ôpor'tô], 2nd city of Portugal, apt. and commercial centre of Douro, 2 m. from sea; pop. 279,738; textiles, port wine, 6-267, 268 illus.

Opossum. A marsupial, 5-521, 5-137; fur, 3-496.

"Oppidans," at Eton college, 2-304.

Opposition, The. In parliament, chief minority party; functions of, 4-51.

Ops. In Rom. myth., goddess of plenty.

Opsonin. Germ-fighting substance in the blood.

Optical Glass. Any kind used in optical instruments. See **Glass**.

Optical Instruments, lenses for, 4-482.

Optic Nerve, and "blind spot" of eye, 3-332.

Optics. The science of light, 5-522; careers in optical work, 2-238; lens, 4-180; spectacles, 7-126. See also **Eye**; **Light**; **Microscope**; **Photography**; **Telescope**.

Opuntia [ôpun'shia]. A genus of cacti.

Oracle. In anc. Greece seat of worship of a deity where responses were given to inquirers, usually about public events. Also used for response itself. Usually given by priest in trance, and supposed to reveal will of the gods; at Delphi, 3-69.

Oradea Mare or Nagy-Varad. City in w. Rumania; pop. 92,940; old Hungarian tn. founded by St. Ladislaus (1080); potteries and agricultural trade; ceded to Hungary, 1940-45.

Oradour-sur-Glane. Vill. of Fr., Haute-Vienne dept., in 2nd World War it was totally destroyed by Germans, and nearly all the 750 inhabs. killed. June 1944, as mistaken reprisal for resistance by the people of a vill. of similar name; the ruins remain as memorial.

Oræafajokull. Volcano in Iceland (6,425 ft.), 4-233.

Oran [ôran']. Algeria. Prosperous city on S. coast of Africa, 230 m. s.w. of Algiers; pop. 256,661; Britain attacked French Fleet July 2, 1940, 1-110, 7-489; U.S. troops occupied it in Nov. 1942.

Orange. Principality in s.e. Fr.; fell to House of Nassau in 1531, under Nassau-Orange family until 1702, annexed to France in 1714.

Orange. Citrus fruit, 5-524, 525 illus.; essential oil from orange blossom, 6-125.

Orange, House of. Princely family whose heads were sovereigns of Orange (s.e. Fr.), also held large possessions in the Netherlands and thus became defenders of Dutch liberty against Sp. oppression, and ancestors of present Dutch royal line.

Orange Free State. Province of the Union of S. Africa; area 49,647 sq. m.; pop. 1,018,207; cap. Bloemfontein; 5-524, 7-88, 2-81; settlement, 7-91, 1-51. goldfield, 7-88.

Orangemen. Members of Orange Society of Irish Protestants (essentially political) originating in Ulster; name derived from King William III (Prince of Orange), 4-282; and battle of the Boyne, 2-32.

Orange moth, protective coloration of larva, 6-296 illus. f.

OREBRO

Orange River. Longest r. of S. Africa, 1,360 m. long, 5-524, 1-51, 7-91.

Orange Tip butterfly, 2-140 illus.

Orange-utan. Member of the ape family, 5-526; skeleton and Man's compared, 1-180, 181 diag.

Oratorio, in music; as forerunner of opera, 5-513.

Oratory, Demosthenes, 3-70; in growth of literature, 4-445.

Orb, in Brit. crown jewels, 2-536, 2-frontis.

Orbit. Path of a planet round the Sun, of a satellite round its principle, or of any component of a double or multiple star relative to the rest, 7-188, 6-212. Hence by extension the path of any object considered as revolving round another; e.g. electrons in the original Rutherford and Bohr models of the atom, 1-297.

Orbital. In atomic theory, 2-318.

Orades. Name given in early times to the Orkney Is., 6-5.

Oragna, or Andrea di Cione. 14th cent. Italian painter, sculptor, and architect, one of Giotto's principal followers, 4-317.

Orchard, soil and cultivation of, 3-480.

Orchardson, Sir William Quiller (1835-1910). Brit. artist; notable as painter of romantic and historical subject pictures, e.g. "On Board the Belleophon," 5-321.

Orchestra, 5-526; string quartet, 7-492, part of theatre, 7-263. See also **Musical Instruments**.

Orchid. Plants of the family *Orchidaceae*, 5-529; fertilisation, 3-399; ovary and seeds, 3-396 diag.

Orohemus [ôrô'hémus]. Anc. Gk. city in Boeotia; great continental and maritime power in prehistoric times, cap. of the Minyæ, a sea-faring people from Thessaly; superseded by Thebes.

Orszý [ôr'shý], Emmuska, Baroness (1865-1947). Brit. novelist and playwright, b. in Hungary; *The Scarlet Pimpernel*, presented on stage and screen, *The Blusie Pimpernel*, etc.; memoirs *Links in the Chain of Life*, 1947.

Order. Division of a class of living organisms, 1-452.

Order in Council. In Gt. Brit., any order issued by the sovereign on advice of the privy council.

Orderly Room. Brit. army and air force unit's office; and adjutant's duties, 1-20.

Order of Mercy. Established in 1899 in connexion with the League of Mercy to promote the welfare of hospital by obtaining subscriptions for King Edward's Hospital Fund for London.

Order of Merit (O.M.). British honour 5-530.

Orders and Decorations, 5-529. See also **Knighthood**.

Orders of Architecture, 5-532, 531 illus.

Ordinance. An established rule, i.e. law, custom, or ceremony; often used among Presbyterians for the sacraments.

Ordinary, charge in heraldry; type of, 4-165, 164 illus. f.

Ordinary Shares. See **Stock Exchange Terms** (list).

Ordination of Clergy. The act or rite of investing with priestly or ministerial functions.

Ord'nance. Heavy firearms, such as mortars and cannon. See **Artillery**.

Ordinance Survey. The official map survey of Gt. Brit. and N. Ire.; came into existence in 1784; headquarters at Chessington, Surrey; mapping 5-119.

Ordovician Period. In geology, 3-515, 516.

Ore. See **Money** (list).

Oreads [ôr'rédz]. In Gk. myth., nymphs of mts. and grottoes, Echo being one of the most famous, 5-488.

Orebro [ôr'brô], Sweden. Mfg. tn. on r. Svarta, near w. end of 1540 Hjelmars; pop. 59,880; diet of 1810 declared crown hereditary; diet of 1810 elected the French marshal Bernadotte crown prince.

OREGON

Oregon. State of U.S.A.; area 99,081 sq. m.; pop. 1,521,341; cap. Salem; 5-532.

Oregon Treaty (1846). British (Columbian boundary settled, 2 82.

Orellana, Francisco de (c. 1490-1550). Spanish explorer; Amazon discoveries, 1-130.

Ore Mountains. See *Erzgebirge*.

Orenburg, now Chkalov. Town in S.E. Russia on r. Ural; pop. 172,920.

Ores. Natural substances containing metals, 5-216.

Orestes, The. Group of three dramas by Aeschylus telling the story of Orestes, 1 45.

Orestes (ores'tez). In Gk. myth., son of Agamemnon and Clytemnestra; killed his mother because she had killed his father, 1 45.

Organ. A musical instrument, 6 1, 5-307; in early Christian era, 5-302; how sound is produced, 7-87 illus.

Organic Acids, atomic arrangement; origin of, 1-12.

Organic Chemistry. The study of the compounds of carbon. Owing to the ability of carbon atoms to combine together in long chains, organic compounds are far more numerous than those of other elements. They are the basis of all living matter; 2 319.

Organic Evolution. Evolution of living organisms. See *Evolution*.

Organization for European Economic Co-operation, and Marshall aid, 5 137.

Organs, in human body, 6 189.

Organsine. Silk yarn used for warp in silk weaving, 7 51.

Oriel (or'iel). In architecture a projecting window, of polygonal or semi-cylindrical form, and divided by mullions and transoms into different bays, and other proportions.

Oriel College, Oxford Univ.; foundation, 6 17.

Origen (or'ien) (c. 185-254). Early Christian theologian, native of Alexandria, Egypt; his authority waned as Augustine's waxed; sought to reconcile Platonism and Christianity.

Origin of Species, The (1859). Work on evolution by Charles Darwin, 3 52.

Orinoco. R. of S. Amer., 1,600 m. long, 6 3, 7 385; Raleigh's expedition, 6 363.

Oriole. Family of birds, 6 4.

Oriol. Giant and hunter of Gk. myth., slain by a scorpion bite for boasting about his hunting prowess.

Orion. Constellation, 2-490 diag.; nebula in, 5 360.

Orissa. State of Rep. of India, including former Brit. prov. of Orissa and 20 princely states. Area 59,869 sq. m.; pop. 14,611,293. On E. coast of Indian peninsula. Cap. Cuttack (pending construction of new cap. Bhubaneswar); rice growing, milling and silver work are chief industries; 4 211; Hindu temple, 4-216 illus.

Orizaba. Mt. peak in Mexico, 18,086 ft., 5-186.

Orkhan. Sultan of Turkey, reigned 1326-59; son and successor of Othman, 7-333.

Orkney Islands. Group of isls. forming co. of Scot.; 375 sq. m.; pop. 21,258; cap. Kirkwall; 6 4.

Orlando, Vittorio Emanuele (1860-1952). It. statesman; favoured intervention in 1st World War in advance of his party; prime minister (1917-19); retired from politics on advent of fascism.

Orleanists. Fr. political party in 15th cent., supporters of the house of Orleans as opposed to that of Burgundy; also in 19th cent., a party led by the house of Orleans; sought to establish constitutional monarchy; wars under Charles VI, 2-308.

Orleans, Dukes of. Heads of a younger branch of Fr. royal house of Bourbon.

Orleans, Louis Philippe, Duke of (1747-93). "Philippe Egalité," the regent's great grandson; as "Citizen Equality" was elected Paris deputy to Convention in 1792; voted for death of Louis XVI; executed under the

Terror. His son was Louis Philippe, king of the French.

Orléans, Philip, Duke of (1671-1723). Regent of Fr. during minority of Louis XIV; able but dissolute and corrupt; falls Voltaire, 7 106.

Orléans. Fr. historic city on r. Loire; pop. 70,780; 6-5; captured by Joan of Arc, 4 376; siege of, 6-421, 4-201.

Orlov. Famous diamond; one of the Russian crown jewels; history, 3-81, 82 illus.

Ormuz. A small barren isl. at entrance to Persian Gulf; in Middle Ages h.q. of trade between Persia and India; red ochre and rock salt; pop. 1,000; 6-134.

Ormuzd. Alternative name for ane. Persian god, Ahura Mazda (q.v.).

Orne. R. of Fr., 91 m. long. Rises in dept. of Orne. Flows N.W. then N.E. through Normandy to Eng. Channel.

Ornithology. Division of zoology dealing with the study of birds; Audubon's work, 1 307; photography as aid, 6-169, 181 illus.

Ornithopter. Type of aircraft with flapping wings, 1 30 illus.

Ornithosauria. An extinct order of flying reptiles.

Orontes. R. of Syria, 7-217 illus.

Orpessa. Float, of mineweeper, 5-221.

Orozeo, José Clemente (b. 1883). Mexican painter; decorated public buildings; went to U.S.A. in 1927 where style became more expressionist, 5-188.

Orpen, Sir William (1878-1931). Brit. painter; one of the foremost portrait painters of the 20th cent.; elected R.A., 1919; official war artist; many of his finest pictures in Imperial War Museum; 3-262.

Orphans. Bernardino's work for, 1 370.

Orpheus. In Gk. myth., musician of marvellous powers, 6 6.

Orpington, Kent; pop. 63,344; as dormitory town for London, 4 398.

Orris root. Dried rootstock of iris; as source of essence of violet, 4 281.

Orsini (ors'e-ni). A noble Rom. family, champions of Gueffs against their hereditary enemies, the Colonna; first prominent in 12th cent.

Orsova. Tn. in Hungary on r. Danube, 3 47 illus.

Osted, Hans Christian. See *Oersted*.

Orta, Lake, Italy, 7 m. W. of Lake Maggiore, 4 311 illus.

Ortiz (ortez) Fr. Small tn. in Basses Pyrénées dept., 40 m. E. of Bayonne; here the Fr. under Soult were defeated by Wellington, Feb., 1814.

Orthochromatic film, in photography, 6 181.

Orthoic acid. A glassy, variously coloured silicate of potassium and aluminum.

Orthodox Church. See *Greek Orthodox Church*.

Orthopaedics, in medicine, 5-165; orthopaedic surgery, 7-195.

Orthoptera. (Zool.) Order of insects, including cockroaches and grasshoppers, in classification of Insects, 4-270, 5-116.

Ortolan. A hunting, with plumage of reddish-brown, the throat being yellow and the breast and head green; found in Africa and Europe; netted in S. Europe and fattened for the table.

Orwell, George. Pen-name of Eric Arthur Blair (1903-50). Brit. writer. Wrote realistically on lives of the poor (*Road to Wigan Pier*); served with Republicans in Spain 1937, but wrote bitter satires *Animal Farm* (on Soviet Communism), and *Nineteen Eighty-Four* (on totalitarianism).

Orwell. R. of Suffolk, extending from Ipswich to the Stour estuary at Harwich; 10 m. long; 7-182.

Oryx. Genus of large antelopes; includes about four species; Abyssinian, 1-67 illus. f.

Osage. R. of U.S.A., a tributary of the Missouri in Kansas and Missouri; 500 m. long.

Osage orange. N. Amer. tree with

OSTADE

inedible fruit, resembling a large orange; wood bright yellow, fine-grained and very elastic.

Osaka. City and port of Japan, in Honshu, at head of Osaka Bay. Commercial and industrial centre; pop. 2,547,321; 6-6, 4 310, 3 12.

Osborne. Mansion nr. E. Cowes, Isle of Wight, now part used as convalescent home for army and navy officers; originally built for Queen Victoria, 1845.

Osbourne, Lloyd (1868-1917). Amer. author, stepson of R. L. Stevenson, with whom he collaborated in *The Wrecker* and *The Ebb Tide*. Stevenson's famous *Treasure Island* was written for him.

Oscar I (1799-1859). King of Sweden and Norway, son of Bernadotte (Charles XIV), succeeded to throne in 1844.

Oscillation. The generation of alternating currents in a resonant circuit (a circuit in which positive inductance and negative reactance are balanced), usually with the aid of a thermionic valve.

Oscillator. Apparatus set up by Hertz to demonstrate existence of electromagnetic waves, 6 311; production of ultrasonic sounds, 7 314.

Oshogbo. Tn. in Nigeria, W. Africa; pop. 123,000; 5 435.

Osiris. Anc. Egyptian deity, 6 6; husband of Isis, 4 301, 3 183.

Oster, Sir William (1849-1919). Canadian physician, professor of medicine at Johns Hopkins Univ. (1889-1901); became Regius professor of medicine at Oxford in 1905; author of many medical works; 5 165.

Oslo. Cap. of Norway, at head of Oslo Fjord; pop. 428,000; 6 7; town hall, 5-466 illus.

"Oslo Breakfast." A vegetarian meal, 6 7.

Oslo Fjord, Norway, 5 462, 6 7 with illus.

Osman. See *Othman*.

Osmanli Turks. See *Ottoman Turks*.

Osmiridium. Natural alloy of osmium and iridium; in fountain-pen nibs, 1 116.

Osmium (Os). A metallic element of the platinum group; atomic no. 76; atomic weight 190.2; found associated with iridium; used as a catalyst and filament for electric light bulbs; most dense substance on earth; 3 224.

Osmosis. The flow of water or other solvent through a membrane which will permit the passage of the solvent but not of the dissolved substances. There is a tendency for solutions so separated to become equal in molecular concentration; thus water will flow from a weaker to a stronger solution, the solutions tending to become more nearly equal in concentration.

Osnabrück. Industrial tn. of Ger. in the Land of Lower Saxony, on r. Hase, 30 m. N.E. of Münster; pop. 108,900; iron and steel mfrs.; member of Hanseatic League; until 1815 seat of a prince-bishop.

Osprey. Large bird of prey, feeding on fish; extinct in Britain; 7-168 with illus.

Ossa (mod. Kissovo). Mt. in Thessaly, Greece. See *Pelion*.

Ossawatimie, Kansas, U.S.A. (City 15 m. S.W. of Kansas City) pop. 4,772; attack by pro-slavery men (1856) resisted by John Brown and followers; later finally overpowered and practically destroyed, 2-93.

Ossian or Olaf (3rd cent. A.D.). legendary Gaelic bard, son of Finn; supposed author of Macpherson's "Poems of Ossian," 4-287.

Ossipovsk'. Mkt. tn. of Ukraine S.S.R., formerly Berdichev; 120 m. W.S.W. of Kiev; grain, cattle, horses; pop. 66,306.

Ostade (ostah'de), Adriaen van (1610-85). Dutch painter, pupil of Hals; vigorous treatment of rustic life, 5-384.

Ostade, Isaac van (1621-49). Dutch painter, brother of Adriaen, 5-384.

OSTEND

Ostend, Belgium. Spt. and resort on North Sea; pop. 50,500; repeatedly shelled in 1st World War, harbour closed by Brit. by sinking of ships, May 10, 1918; in Ger. occup., 1940-44; 1-417.

Osteopathy. A system of treating bone disorders by manipulation. It is accepted that adjustment of misplaced bones, ligaments or cartilages may alleviate or cure many pathological conditions.

Osterley Park. Mansion in Middlesex, Eng.; Adam's work on, 1-11.

Ostia. Spt. for Rome at mouth of Tiber, 7-272; built by Ancus Marcius, 6-429.

Ostlaks. Tribe of Finno-Ugric group inhabiting Ob valley in w. Siberia.

Östmark. Ger. name for state of Austria during annexation, 1938-45.

Ostrich. A flightless running bird, the largest of living species, 6-8; egg, 3-171 diag.; foot, 1-171 illus., 3-413 illus.

Ostrogoths. Ano. German people; the eastern branch of the Goths, 4-49, 8-313.

Ostwald (öst'vahl't), Wilhelm (1853-1932). Ger. chemist; leader in physical chemistry; Nobel prize for chemistry 1909.

Oswestry. Market tn. in Shropshire, Eng., 17 m. n.w. of Shrewsbury; has rly. works, tanning and brewing industries; pop. 10,713, 7-44.

Otago. Largest prov. of South Island, New Zealand. Area 25,230 sq. m.; pop. 233,000. Wheat and oats are main crops. Sheep are reared; gold mined. Dunedin is cap.

Otaheite. See Tahiti.

Otazu, Japan. Chief tn. on w. coast of Hokushu Isl. on s. shore of Ishikari Bay; pop. 154,000; marine products, experimental station; fisheries; large trade.

Otello. Opera by Verdi, 5-519.

Othello. Tragedy by Shakespeare, 6-9.

Othman or **Osman** (c. 1259-1326). Turkish sultan, founder of Ottoman Empire, 7-333.

Otto. See Otto.

Otranto (öt'ran'tō). Spt. on s.e. coast of Italy, 46 m. s.e. of Brindisi; pop. 2,152; during Middle Ages chief Adriatic port of Italy; sacked by Turks (1480).

Otranto, Strait of. A Passage connecting Adriatic and Ionian seas and separating Italy from Albania; minimum width about 45 m.

Ottar, or Onthore (9th cent. A.D.). Norwegian explorer; rounded North Cape and discovered White Sea.

Ottawa, Ontario. Cap. of Canada, on r. Ottawa; pop. 202,015; 6-9, 10 illus., 2-202, 5-512.

Ottawa, University of. At Ottawa, Ontario; Rom. Cath.; founded 1819 (univ. since 1889); arts, science, theology, law, commerce.

Ottawa Conference. Agreements between U.K. and Dominions were signed at Ottawa in 1932 relating to mutual preferential tariffs.

Ottawa River, Canada. Chief tributary of St. Lawrence; rises in Quebec, flows w., then s.e., forming boundary between Quebec and Ontario; length 685 m.; enters St. Lawrence by 2 channels enclosing Isl. of Montreal, 5-50, 6-9.

Otter. Aquatic animal related to the weasel, 6-10, 11 illus.; fur from 3-496; otter hunting, 4-209.

Otterburn. VII. In n.e. Eng., near Scottish border; Scots under Douglas defeated English under Percy (1388); battle celebrated in Ballad of Chevy Chase, 5-461.

Otterhound. Brit. breed of sporting dog, 4-209.

Otto I (936-973). Ger. king and Holy Rom. emperor; restored empire of Charlemagne, 4-7, 3-314, 4-188; coronation, 4-306; defeat of Magyars (955), 4-306.

Otto II (955-983). Holy Rom. emperor, 4-306.

Otto III (980-1002). Holy Rom. emperor; and Charlemagne's tomb, 1-1.

Otto I (1048-1016). King of Bavaria; insane throughout reign (1086-1012); his uncle, Prince Luitpold, acted as regent, and on his death Otto was deposed; 1-389.

Otto, Nicholas (1832-91). Ger. engineer. Inventor of Otto four-stroke internal-combustion engine 4-273.

Ottoman Empire. 7-333; Constantinople as cap. of, 4-304.

Ottoman Turks. Tribe of Turks which founded Turkish Empire; named from Othman, first sultan (reigned 1288-1326); 7-333; rule in Egypt, 3-175; rule in Palestine 6-46.

Otway, Thomas (1652-1685). Eng. dramatist. A master of tragic pathos, he wrote numerous plays, of which *The Orphan* and *Venice Preserved* were the finest and remained for nearly 200 years stock pieces on the English stage. Latter revived 1953.

Ouachita Mts., Arkansas, U.S.A., 3,000 ft. high, 1-339.

Oudenarde, Belgium. Town on i. Scheldt, 18 m. s. of Ghent; victory of Marlborough over French (1708) 5-132.

Oudh (ōd). Region of n. central India, part of Uttar Pradesh, Republic of India.

Ouida (we'da). Pen name of Louisa de la Ramée (1839-1908). Brit. novelist (*Under Two Flags*; *Moths*; and children's stories, *The Narnberg Store*; *A Dog of Flanders*).

Oulton Broad, Eng. Shallow lake in Suffolk, frequented by yachtsmen.

Ounce, or Snow Leopard, 4-481.

Ounce (oz.). A unit of weight in the avoirdupois, troy and apothecaries systems, and a unit of fluid measure. See Weights and Measures.

Oundle. Market tn. in Northants, Eng.; boy's public school founded by Grocers' Co. (1558) under the will of Sir W. Laxton. F. W. Sanderson (1857-1922), headmaster from 1892, noted as one of great educationalists of modern times. pop. 2,221; 5-456.

Ourthe (nort). R. of Belgium, flows n. 100 m. to Meuse.

Ouse (ōz). R. of Yorkshire, Eng. joining the Trent to form the Humber; length 60 m.

Ouse. R. of Sussex, flowing 30 m. to the Eng. Channel.

Ouse, Great. R. of cent. and e. Eng. flowing into Wash near King's Lynn length 180 m.; 1-404, 4-210.

Outboard Motor. Internal-combustion engine, usually of two-stroke type attached to stern of a small boat.

Outram (ō'tram), Sir James (1803-63). Brit. soldier, at Lucknow 4-253, 5-49.

Outrigger Canoe, of Solomon Islanders. 6-31 illus.

Outside Broadcasting. mobile van. 6-348 illus.

Oval, Kennington, s.e. London. Surrey county cricket ground; scene of many test matches.

Ovambo, The. African tribe, 1-51.

Ovary, in plants. The receptacle in which fertilised ovules develop: 3-395 with diag.

Ovate. In botany a leaf broader near the base than at the top, e.g. deadly nightshade, 4-470, 471 illus.

Ovenbird. S. Amer. birds which build nests shaped like bakers' ovens.

Overcasting. In sewing, 7-7.

Overhand Knot, how to tie, 4-421 illus.

Overlord, Operation. Code name for the Allied invasion of Normandy which began June 6, 1944.

Overseas Careers. 2-238.

Oversewing. 7-7.

Overture. See Musical Terms (list).

Ovid (Publius Ovidius Naso) (43 B.C.-A.D. 18). Rom. poet, 4-451.

Oviedo. Industrial city of N. Sp. 16 m. s. of Bay of Biscay; pop. 86,724; univ.; held successfully by insurgents against a siege in Civil War (1936).

Oviparous Animals, those which lay eggs, 4-269.

Ovis. The sheep genus.

Ovules. Immature seeds produced by ovaries in flowers, 3-395 with diag.

OZONE

Owen, Robert (1771-1858). British social reformer; turned his cotton mills into a kind of philanthropic trust; advocated Factory Acts, inspired many kinds of social reform, and established co-partnership colonies in Brit. and U.S.A.; 7-81.

Owen Falls, Lake Victoria, Uganda; dam at, 3-33, 5-440.

Owl. A nocturnal bird of prey, 6-11; incubation of eggs, 1-460; as destroyer of mice, 1-455; retina of eye, 3-332; wing feather, 3-344. *How Screecher Learned to Hunt*, story, 6-13.

Oxalis. A genus of plants including the wood sorrel; oxalic acid a poison, 6-236.

Oxenstierna (öks'ensherna), Count Axel Gustafsson (1583-1654). Noted Swedish statesman; became chancellor in 1612; exercised great diplomatic ability in directing foreign policy of Sweden and in conducting government at home; held absolute control in central Germany during Thirty Years' War; guardian of Queen Christina of Sweden, who opposed him.

Oxeye. See Great Tit.

Ox-eye Daisy, 2-385, 2-24 illus. 1.

Ox family, or Bovidae. A sub-family of hollow-horned ruminant mammals, including cattle, etc.

Oxford. Famous univ. city in Oxfordshire, Eng.; pop. 98,675; 6-17.

boat-race, 1-497; Matthew Arnold on, 1-254; St. Giles's fair, 3-336 illus.; University, 7-368.

Oxford and Asquith, Herbert Henry Asquith, 1st Earl (1852-1928). Brit. statesman, 6-20; and Liberal party 4-485, 7-351.

Oxford Book of Ballads. bullad collection, 1-351.

Oxford English Dictionary. 3-88.

Oxford Movement. A movement begun in 1833 by some Oxford clergy to revitalise the Church of Eng., also called Tractarianism; Newman and 5-398.

Oxfordshire. Co. of Eng.; area 718 sq. m.; pop. 275,765; co. tn Oxford; 6-21.

Oxford University. 6-17, 7-368; athletics, 1-292; boat race, 1-497, 6-459.

Oxidant. A ferment that produces oxidation.

Oxidation. Chemical union of oxygen with other affinitive substances, 6-22.

Oxides. Compounds of metals with oxygen, 6-23.

Oxlip, a species of Primula, 2-523 3-399.

Oxus River. See Amu-Daria.

Oxy-acetylene Cutting Tools, 1-10.

Oxygen. A gaseous element of the sulphur group; atomic no 8; atomic weight 16; 6-22, 3-224; percent age and behaviour in air, 1-79 80; in aquarium, 1-188; exchange in blood, 4-144; in bunsen burner, 2-124; in combustion, 3-357; oxidation of iron, 6-481; laboratory methods of producing, 2-322; named by Lavoisier, 4-457; in oxy-acetylene cutting, 1-10; produced by plants, 6-183, 6-215, 4-469; discovered by Priestley, 6-287; in respiration, 6-389, 5-51 liquid oxygen rockets, 6-423, 421.

Oxyhaemoglobin. Combination of oxygen and haemoglobin in red corpuscles; in arterial blood, 1-489.

Oxy-hydrogen Blowpipe, 4-221.

Oyo. Tn. in Nigeria, W. Africa; pop. 72,000; 5-435.

Oyster-catcher. Bird of the plovers family, 6-227, 7-404, 1-468 illus.

Oyster Fungus, 3-489 illus.

Oyster Mine, in naval warfare, 5-220.

Oyster Plant. See Salinity.

Oysters. Bivalve shell-fish, 6-23; pearl from, 6-101; starfish and, 7-150.

Ozark Mts., Oklahoma, U.S.A., 5-507.



Oza, Mount. Formerly Parne, in Greece, 15 m. N. of Athens; 4,600 ft. 1-287.




Ozh. Tn. in Kirghiz S.S.R., of very recent development, 4-414.

Ozone. Allotropic form of oxygen 6-23; in air, 1-80, 81; in air conditioning, 1-52.

P

ONE of the Egyptian hieroglyphs was a shutter .

This developed into the character  which was borrowed by the Phoenicians. They called it *Pe*, "mouth," perhaps because it looked like a mouth with teeth. When they themselves wrote it, they simplified it so that it is hard to see the resemblance to a mouth  but they still kept the name. The Greeks used the same form, but turned the hook to the right. They

afterwards squared the top thus  and finally made the two legs of equal length, in the character  which became the modern Greek letter *pi*. The Romans adopted the rounded form , which they curved more and more, until finally the semi-circle was closed exactly as in our letter P. Its name has changed very little, nor has its sound, formed by closing the lips for an instant, and then allowing the breath to escape through them explosively.

Paasikivi, J. K. (b. 1870). Finnish statesman; negotiated with U.S.S.R. in 1920 and 1939; prime min. 1944-46; pres. of republic, 1946-56.

Paeard, Dr. M. (1757-1827). First ascent of Mont Blanc (1786), 1-126.

Pacheco, Francisco (1571-1654). Span. painter, teacher of Velazquez, 7-112.

Pachmann [pak'h'man], Vladimir de (1848-1933). Rus. pianist, especially noted for brilliant interpretations of Chopin's works and for his platform eccentricities.

Pachomius [pak'om'us], Saint (c. 292-c. 346). Egypt. monk; established first monastery, 5-243.

Pachuca [pak'ch'us'ka], Mexico. City 55 m. N.E. of Mexico City; altitude 8,000 ft.; pop. 52,452; cap. state of Hidalgo.

Pacific Islands, 6-25.

Pacific Ocean. Largest of the oceans, 6-25; area and depth, 5-494; discovery by Balboa, 1-133, 1-348; crossed by Magellan, 6-77; submarine cables, 2-154; in 2nd World War, 7-491, 493, 494, 498.

Pacific type of locomotive, 5-2, 3 illus.

Padang [pah'dang], Sumatra, Indonesia. Tn. on W. coast; pop. 52,000.

Paddington. Metropolitan bor. of W. London; pop. 125,281; formerly noted for picturesque rural scenery; London terminus of W. Region (Brit. Rly.); 5-27, 6-523 illus.

Paddle Steamers, 7-30.

Paddy. Malayan name (*padr*) for rice, 6-390.

Paddy's Milestone. See *Aissa Craig*.

Paderewski, Ignacy Jan (1860-1941). Polish statesman and musician, 6-32.

Padua [pad'oo] (It. Padova). It. educational and art centre and trade and mfg. city on R. Bacchiglione, 22 m. W. of Venice; pop. 138,000; univ. (13th cent.) one of the oldest in Europe; Giotto's work, 4-21.

Paestum [pes'tum] (originally Posidonia). Gk. city on W. coast of It. on Gulf of Salerno; founded 6th cent. B.C.; conquered by Romans, 273 B.C.; destroyed by Saracens in 9th cent.; ruins of 3 Doric temples among most remarkable of antiquity.

Paganini [pagah'ne], Niccolò (1781-1840). It. violinist, called "most extraordinary executant ever known"; great power and control of tone, intense passion of style.

Page, Sir Frederick Handley (b. 1885). Brit. aeroplane designer; founded firm that bears his name in 1909; invented 1927 wing-slots that increase stability of aeroplanes in flight.

Page, training for knighthood, 4-417.

Pageant. Old name for stage on wheels, 3-117.

Pagliacci, L. Opera by Leoncavallo; story, 5-519.

Pagoda. An Oriental sacred tower-like structure; at Rangoon, 6-363 illus.

Pago Pago. U.S. naval and air base on Tutuila, one of Samoan Is., 6-494.

Pahang. State of the Federation of Malaya; area 13,820 sq. m.; pop. 250,178; 5-94.

Pahlevi, Mahomed Riza (b. 1919), Shah of Persia since 1941, 6-132.

Pahlevi, Riza (1877-1944). Shah of Persia 1926-41, 6-132.

Paine, Thomas (1737-1809). Brit. author and reformer, 6-32.

Painted Desert, Arizona, U.S.A., 1-238.

Painted Lady butterfly, 2-140 illus.

Painting, History of, 6-33; Dutch and Flemish, 5-381; English school, 3-258; fan painting, 3-340; Impressionism, 4-237; Japanese, 4-351, 352; the Madonna in art, 5-66; Post-Impressionism, 6-270; Pre-Raphaelites, 6-284; Renaissance, 6-386; Roman, 6-410, 443, illus.; Spanish, 7-112. See also table in next page.

Paints, 6-37; aluminum in, 1-129; chromium compounds in, 2-383; used in oil and fresco painting, 6-36; spraying motor-cars, 5-281 illus.

Paisley. Industrial tn. in Renfrewshire, Scot., noted for cotton-thread; pop. 93,704; 6-387.

Pala, Rue de la. Street in Paris, 6-83.

Pakistan. Muslim country in subcontinent of India; area 360,935 sq. m.; pop. 75,842,165; cap. Karachi, 6-39, 4-239; flag, 6-44, 3-384 illus. f.; formation, 2-84; dispute with India over Kashmir, 4-304; trade with Afghanistan, 1-46; devaluation, 6-44; Jinnah, 4-376; gvt., 2-338 illus.; natural gas in, 5-331.

Palace of the Soviets, Moscow, 5-268.

Paleolithic Age, or Old Stone Age, 5-106, 7-102; flint implements, 3-389.

Palaontology. Branch of biology dealing with fossil remains, 1-451; evolutionary evidence, 3-321; results of study, 3-425; and primitive Man, 5-104.

Paleozoic Era. In geology, 3-515, 516.

Palais de Chaillot, Paris, 6-81.

Palamon and Arcite, The Knight's Tale, retold from *Canterbury Tales*, 2-312.

Palanquin [palan'kin]. Covered litter for carrying passengers; in Korea, 4-426 illus.

Palate. The roof of the mouth; it consists of the hard palate in front and the soft palate behind; the former has a bony framework, while the latter is composed of muscular fibres, enclosed by a movable fold of mucous membrane.

Palatinate, The, or Rhenish Palatinate (Ger. Rheinpfalz). Prov. of Bavaria, Ger., lying W. of Rhine; Heidelberg former cap.

Palatine [pal'atin] Hill. Central and earliest settled of the 7 hills of Rome; its rectangular shape gave name *Roma quadrata* to primitive city founded, according to legend, by Romulus.

Palau Islands. See *Pelew Islands*.

Palawan [palah'wahn]. Westernmost of the larger Is. of the Philippines; 4,500 sq. m.; 6-156.

Palazzo Vecchio, Florence, It., built 1298-1314, 3-392.

Pale, The. From time of Henry II up to conquest of Ireland under Elizabeth I, that part of Ireland where Eng. law prevailed, as opposed to Celtic portion of island. Hence phrase "beyond the pale."

Pale Clouded Yellow butterfly, 2-140 illus.

Palembang. Port of Sumatra, Indonesia; pop. 109,000; on R. Musi, 45 m. from its mouth; export trade; makes silk, gold articles and weapons.

Palermo. Cap. and spt. of Sicily; pop. 501,005; univ.; 7-49, 50 illus.;

industries incl. shipbuilding, engineering, cement mfr., chemicals, pottery and fruit canning.

Palestine. Region of E. Mediterranean, now divided between states of Israel and Jordan, 6-45; Israel and Egypt, 3-180; anc. Hebrew civilization, 1-269; conquered by Saladin, 6-488; Napoleon's campaign, 5-318; as a Brit. mandate, 7-483. See also Israel; Jews; Jordan.

Palestrina [paless'tre'na], Giovanni Pierluigi da (1524-94). It. composer and master of sacred music, reformer of church music, 5-304.

Paley, William (1743-1805). Brit. clergyman and philosopher, chiefly remembered for his "argument from design" to prove the existence of God (*Evidences of Christianity: Natural Theology*).

Palgrave, Francis Turner (1821-97). Brit. critic and poet (anthology, *Golden Treasury of English Songs and Lyrics*).

Pali [pah'li] (Sanskrit "sacred text"). An anc. language of N. India, surviving in Burma, Ceylon, and Siam; language of Buddhism.

Palimpsest. MS. from which earlier text has been erased and a second written in its place; how original writing is read, 2-2.

Palindrome. Word or sentence which reads the same forwards or backwards, e.g. "Able was I ere I saw Elba."

Palinurus *Paniciellatus*, tropical crawfish, 5-129 illus. f.

Palisade Layers, of leaf; chloroplasts in, 6-182.

Palisade Mts., U.S.A., in New York state, 5-421.

Pallacy, Bernard (c. 1510-89). Fr. artist, potter, naturalist, and writer; one of first men in Europe to formulate correct theory of fossils (*Autobiography*); discoverer of emmetling process, 6-277; dish, 6-276 illus. f.

Palk Strait. Narrow sea between India and Ceylon, 5-69.

Palladian Style, in architecture, 4-91; Inigo Jones and, 4-381 with illus.

Palladio [palah'deo], Andrea (1518-80). It. architect of late Renaissance from whom the classical It. style called "Palladian" is named; influence in Eng., 1-212; truss bridge design, 2-62, 63 illus.

Palladium [palah'dium]. An image of Pallas Athene, especially the one said to have fallen from heaven) which was kept at Troy and believed to be a safeguard of the city.

Palladium (Pd). Rare white metallic element of the ruthenium group; atomic no. 46; atomic weight 106.7; found alloyed with gold; used as a catalyst and absorbent for hydrogen; 3-224; used as setting for jewelry, 4-372.

Pall Mall [pal mal sometimes polmel]. London street famous for clubs, between Cockspur Street and St. James's Palace.

Pall-mall [pol mel]. Old Fr. game, brought to Eng. in reign of Charles I.; balls were driven with mallets through iron hoops fixed in an alley about 800 yards long; gave name to the London street.

PALM

Palm. A tropical tree, 6-50, 7 313, 3-4; coconut palm, 2-441; date palm, 3-52; ivory from palm nuts, 4-332; sago palm, 6-484.
"Palm." Catkins of willow, 7-454-55.
Palma, Jacopo or Giacomo (c. 1480-1528). It. painter of Venetian school; called Palma Vecchio ("The Elder"); strongly influenced first by Bellini, later by Giorgione; work characterised by rich colouring and brilliant lighting.
Palma, Jacopo (c. 1544-1628). Venetian painter, called "the Younger" to distinguish him from his great-uncle.
Palma. Port and cap. of Majorca, largest of Balearic Isles, at head of Bay of Palma; pop. 136,814; lively trade; numerous mfrs.; 1-319. *c*
Palmaceae (palma'ceæ). The palm family of plants.
Palma Dum. See Dum Palm.
Palmate. Bot. term for a type of leaf in which a number of lobes radiate from the base, 4-471 with illus. 6 50.
Palmed Newt. Smallest of Brit. species of newts, 5 407 with illus.
Palm Beach, Florida, U.S.A. Fashion-

able winter resort on s.e. coast, on a peninsula; cut off from mainland by Lake Worth, an arm of Atlantic; residential pop. 3,886; 3-393.
Palmer, John (1742-1818). Brit. mail-transport pioneer; comptroller general of post office 1786; mail-coach system, 6-270.
Palmer. Pilgrims returning from Palestine, who carried with them palm branches as evidence of their pilgrimage, 6 202.
Palmerston, John Henry Temple, 3rd Viscount (1784-1865). Brit. statesman, 6-51.
Palmetto. A type of fan palm, 6 50.
Palm Leaves, as token of victory, 6 51.
Palm Oil. Oil from species of oil palm, 6 50; in margarine, 6-124.
Palm Sunday. In Christian calendar, 6th Sunday in Lent, one week before Easter. Celebrates entry of Jesus-Christ into Jerusalem when palm leaves were strewn before His path.
Palm Wine. Intoxicating drink made from juice obtained from trunk of coconut palm, 2-142, 6-50, 51 illus.
Palmira. Anc. city of Syria; commercial centre under Rom. empire;

ruins of temple and sepulchral towers remain.
Palomar. Peak of the Santa Anna Mts., California, U.S.A. Site of Mount Palomar Observatory; world's largest telescope, 7-250, 249 illus.
Palos. Tn. on w. coast of Sp., 55 m s.w. of Seville; pop. about 1,900.
Paludrine. Valuable anti-malarial drug discovered and used in 2nd World War, 5-93.
Pamir (pamir'), Plateau in cent. Asia at convergence of Hindu Kush, Himalaya, Kuenlun, and Tian Shan Mts.; 1-264, 6-472.
Pampas. Argentine plains; cattle and sheep are extensively reared and wheat is cultivated; 1-223, 6-187
Pampas Deer, of S. Amer., 3 60.
Pamphylia (pamfil'ia). Anc. mountainous region on s. coast of Asia Minor; successively under rule of Lydia, Persia, Macedon, Syria, and Rome; chief cities were originally Gk. colonies.
Pan. In Gk. myth., god of flocks and pastures, 5 52; and Echo, 3-156.
Panama. Republic of Cent. Amer.

SCHOOLS OF PAINTING

ITALIAN

Byzantine (9th-12th century)
Sienese (13th century)
Duccio (1200-1319).
Florentine (13th-15th century)
Truccato: Cimabue (1240?-1300), Giotto (1266-1337), Taddeo Gaddi (1300?-66).
Quattrocento: Fra Angelico (1387-1455), Paolo Uccello (1400-1475), Masaccio (1400-28), Filippo Lippi (1400-69), Verrocchio (1435-88), Botticelli (1434-1510), Ghirlandajo (1439-94).
Cinquecento: Andrea del Sarto (1486-1531), Michelangelo (1475-1504).
Umbrian (15th century)
Piero della Francesca (1423?-92), Perugino (1450?-1523), Pinturicchio (1454-1513), Raphael (1483-1500).
Paduan (15th century)
Mantegna (1431-1506).
Milanese (15th century)
Leonardo da Vinci (1452-1519).
Parmaese (16th century)
Correggio (1494-1534).
Venetian (15th-16th century)
Jacopo Bellini (1400?-70), Gentile Bellini (1429?-1507), Giovanni Bellini (1430?-1516), Carpaccio (1480?-1520), Titian (1477-1576), Giorgione (1477?-1510), Palma Vecchio (1480-1528), Tintoretto (1518-91), Veronese (1528-88), Canaletto (1697-1768), Guardi (1712-93).
Bolognese (16th-17th century)
Carracci (1560-1609), Guido Reni (1571-1642).
Neapolitan
Caravaggio (1569-1609), Salvator Rosa (1615-73).

FLEMISH (14th-17th CENTURY)

Van Eyck (1380-1441), Van der Weyden (1400-64), Memling (1430-94), Van der Goes (1435?-82).
Hieronymus Bosch (1450-1516), Gerard David (1450?-1523),
Quentin Matsys (1466-1530), Patinir (1475?-1524), Van Leyden (1494-1533), Mabuse (1470?-1532).
Pieter Brueghel (1526?-80), Jan Brueghel (1568-1625), Pieter Brueghel the Younger (1564-1638).
Rubens (1577-1640), Van Dyck (1599-1641), Jordaens (1593-1678).
Teniers (1610-90).

DUTCH (17th CENTURY)

Rembrandt (1606-69), Hals (1580-1666).
The "Little Masters": A. van Ostadé (1610-85), I. van Ostadé (1621-40), Steen (1626?-79), Terborch (1617-81), Gerard Dou (1613-76), De Hooch (1629-83), Metsu (1630?-67), Vermeer (1632-75).
Landscape: Cuyp (1620-91), Paul Potter (1625-54), Koninck (1619-88), Ruysdael (1628?-70), Hobbema (1638-1709), W. van de Velde (1633-1707), A. van de Velde (1636-72).

GERMAN (15th-16th CENTURY)

Witz (1400-47), Wolgemuth (1434-1510), Martin Schongauer (1445?-91), Holbein the Elder (1482-1524), Durer (1471-1528), Cranach (1472-1533), Holbein the Younger (1497-1543), Grunewald (1483-1520).

FRENCH (16th-19th CENTURY)

16th century: Clouet (1510?-70), Vouet (1590-1649).
Classical, 17th century: Poussin (1594-1665), Claude Lorrain (Gellée) (1600-81).

Louis Quinze and Louis Seize: Rigaud (1650-1745), Watteau (1684-1721), Lancret (1660-1743), Chardin (1699-1779), Boucher (1703?-70), Greuze (1725-1805).
Classical Revival: David (1748-1825), Ingres (1780-1807) Puvion de Chavannes (1824-98).
Romantic Revival: Géricault (1791-1824), Delacroix (1798-1863).
Barbizon Group: (landscape) Corot (1796-1875), Rousseau (1812-67), Courbet (1819-77) (figure subjects) Millet (1814-75).
Impressionists: Manet (1832-83), Monet (1840-1926), Pissarro (1830-1903), Degas (1844-1917), Berthe Morisot (1841-95), Renoir (1841-1919), Seurat (1859-71).
"Post-Impressionists": Cézanne (1839-1906), Gauguin (1848-1903), Van Gogh (1853-90), Matisse (1869-1954).

BRITISH (16th-19th CENTURY)

Miniaturists: Hilliard (1547-1619), Isaac Oliver (1567?-1617), Peter Oliver (1594-1647), Hoskins (d. 1604), Cooper (1609-72), Gibson (1615-90), Hone (1718-84), Smart (1741-1811), Cosway (1742-1821), Englehart (1750-1829), Andrew Plummer (1763-1837).
17th-Century Portraiture: Lely (Flemish, 1618-80), Kneller (German, 1616-1723).
18th-Century Portraiture: Reynolds (1723-92), Gainsborough (1727-88), Ramsay (1713-84), Romney (1734-1802), Rackham (1756-1823), Hoppner (1758-1810), Lawrence (1760-1830).
Subject Painting: Hogarth (1697-1764), Morland (1763-1804), Blake (1757-1827), Eddy (1787-1810), Wilkie (1785-1811), Landseer (1802-73), Watts (1817-1904), Lord Madox Brown (1821-93), Holman Hunt (1827-1910), Rossetti (1824-82), Millais (1829-96), Burne-Jones (1833-98), Leighton (1830-96).
Landscape: Richard Wilson (1714-82), Crome (1768-1821), Turner (1775-1851), Constable (1776-1837)—also Gainsborough.
Landscape (Water-Colour): Alex. Cozens (1698?-1786), Samuel Scott (1710-72), Paul Sandby (1725-1809), John R. Cozens (1752-97), Girtin (1775-1802), Cotman (1782-1842), Cox (1783-1859), De Wint (1784-1849)—also Turner.
Impressionists: Whistler (American, 1834-1903), Clausen (1832-1914), Sargent (American, 1856-1925), Lavery (1856-1941), Wilson Steer (1860-1942), Sickert (1860-1942), Lucien Pissarro (1863-1914).

SPANISH (16th-18th CENTURY)

Morales (1509-68), El Greco (Greek, 1541?-1614), Ribalta (1551-1628), Ribera (1584-1652), Zurbarán (1598?-1664), Velazquez (1599-1660), Murillo (1617-82), Goya (1746-1828).

20th CENTURY

Continental: Picasso (b. 1881), Braque (b. 1881), Gris (b. 1881), Utrillo (1883-1955), Carrá (b. 1881), Klee (1879-1940), Marc (1880-1916), Dali (b. 1904).
British: Brangwyn (1867-1956), Rothenstein (1872-1956), Wm. Nicholson (1872-1949), Orpen (1878-1931), Augustus John (b. 1879), Sir Alfred Munnings (b. 1878), Sir Gerald Kelly (b. 1879), Dame Laura Knight, Duncan Grant (b. 1885), Paul Nash (1880-1946), C. R. W. Nevinson (1889-1946), Stanley Spencer (b. 1892), Ben Nicholson (b. 1904), Edward Wadsworth (b. 1889), Vivian Pitchforth (b. 1895), Graham Sutherland (b. 1903), John Piper (b. 1903), Edward Bawden (b. 1903), Edward Burra (b. 1906).

PANAMA, ISTHMUS OF

area 28,576 sq. m.; pop. 801,982; cap. Panama City; 6-52, 2-293; map, 2-292; secession from Colombia, 2-459; flag, 3 385 illus. f.

Panama, Isthmus of. Strip of land connecting N. and S. Amer.; runs E. to W. in form of an S; usually regarded as co-extensive with Republic of Panama; average width 70 m.; 6-53.

Panama Canal, 6-53; excavating for, 3-325.

Panama City. Cap. and chief Pacific port of Republic of Panama on Gulf of Panama at S. terminus of Panama Rly.; pop. 111,000, 6 53.

Pan-American Airways. U.S. air transport company; in hist. of air transport, 1 85.

Pan-American Conference or Congress. Name given to meetings of delegates from countries of N., S., and Cent. Amer. to consider questions of mutual interest.

Pan-American Union. Official organization of the republics of N. and S. Amer. maintained at Washington since 1890 for development of commerce and friendship, 7 101.

Panathenaea [panathēnē'a]. Oldest and most important of anc. Athenian festivals in honour of goddess Athens, 1 13.

Panay. Isl. nearly in centre of Philippine group, 6th in size; 1,446 sq. m.; pop. 800,000; holds chief city, 250 m. from Manila; sugar, rice, and copra chief products.

Panchoen Lama. The head of economic and political affairs in Tibet, 7-273.

Panchromatic Film, in photography, 6 141.

Pancreas [pan'krē-ās]. A gland in the abdomen, 4 270; glands of Langerhans and diabetes, 4 28, 27; in digestive system, 3 90, 89 diag., 1 144.

Panda. Bear-like animal, 6 59.

Panda, Giant. One of the world's rarest animals, 6 59.

Panda'nus Tree. Tropical tree or shrub, also called screw-pine.

Pandora. In Gk. myth., the first woman, 6 59.

Panel. In architecture, an area on a wall, etc., sunk below the general surface of the surrounding work; also a compartment in a sunken ceiling, bay, or waistcot.

PAPEN

Panem et Circenses (Lat. bread and circuses). Free food and free shows provided by Rom. emperors; and degeneration of Rom. character, 2-404.

Pan-Germanism. A movement, fostered by the historians Treitschke and Houston Stewart Chamberlain, and others which conceived Teutons as superior race. Doctrine strongly affected Ger. thought in days of William II and of Hitler.

Panhandle, The. Region of mountainous ls., Alaska, extending 600 m. along Pacific coast, 1-90.

Panhandle, The. Region of high table land, Oklahoma state, U.S.A., extending 170 m. W., 5 507.

Panicle. A compound flower-cluster.

Panicum. A genus of grasses including millets.

Pankhurst, Emmeline (1858-1928), Brit. militant suffragist leader; founded in 1903 Women's Social and Political Union, and, with her daughters, Christabel and Sylvia, led campaign of "suffragette" violence before 1st World War.

Pannonia. Prov. of Roman Empire, lying S. and W. of Danube; Illyrians were probably original inhabitants.

Panopticon. Bentham's prison inspection house, 1 130.

Pan-Slavism. Movement toward political and cultural union of nations of Slavic descent; influenced Austro-Hungarian politics, N. and S. Slavs tending toward united action against Magyars and Germans; congresses held in 1848 at Prague, in 1867 at Moscow, and in 1908 at Prague; formation of Czechoslovakia and Yugoslavia was a partial realization of Pan-Slavism.

Pansy. Various species of viola, both wild and cultivated, 6 60; section of ovary, 3 395 diag.

Pantagruel. Giant in Rabelais' satire, *Gargantua and Pantagruel*; son of Gargantua and the last of a giant race, he is boisterous and, as his name is thought to imply, all-thirsty; 4-17.

Pantaloon. Character in Harlequinade, 4 132, 133.

Pantelleria [pantel'ler-ā] or **Pantalària.** Volcanic Isl. in Mediterranean, 62 m. S.W. of Sicily; belongs to prov. of

Trapani, Sicily; 45 sq. m.; exports wine, raisins, fortified naval base, chief tn. Pantellaria (pop. 9,000).

Pan'theism. Belief that the universe as a whole is God, a fundamental part of much anc. Indian philosophy.

Pantheon, Rome. Temple built by Hadrian, now used as church, 1-209, 211 illus.

Panthéon [pahntā'nwān], Paris. Formerly church of Ste. Geneviève, begun in 1764; secularised at Revolution and dedicated to great men of nation; later again used as church, but finally secularised by decree of 1885, 6 84.

Panther. Name given to species of leopards native to S. Asia, 4 184.

Panth-Piploda. Former prov. of British India (area 25 sq. m.; pop. 5,000); merged in Madhya Bharat, 4-239.

Pantograph. An instrument for copying, enlarging and reducing, 7-340, 341.

Pantomime, 6 60; and Harlequinade, 4 133.

Panza, Sancho. Character in *Don Quixote*, 2-295.

Panzer (Ger. "coat of mail"), Ger. armoured div. of 2nd World War.

Pap, The. Mt. of Inverness shire, Scot. (3,110 ft.), 4 275.

Papacy. Office and dignity of the Pope, 6-60; assumed leadership of Italy under Gregory the Great, 4-306; origin of struggle between Papacy and Holy Rom. Empire, 4 308, 4 118; and the Papal Line, 1-132, 133; and Avignon, 1 330. Inquisition, 4-263; Reformation, 6 370; Papal states, 4 306, 6 62; Rom. Catholic Church, 6-126; Vatican City, 7-382. See also **Popes** (list).

Papal Guard, at the Vatican, 7-383 illus.

Papal States, Italy; origin of, 4-306; power ended in 1870, 6-62, 4-316.

Papaver somniferum. The opium poppy; production of opium, 5 521.

Papaw. Tropical tree with orange-coloured fruit, 3-479.

Papeete [papē'tē]. Chief tn. on Isl. of Tahiti, one of the Society Is., in S. Pacific, harbour, 6 27 illus.

Papen, Franz von (b. 1879). German politician; chancellor in 1932; Ger. min. in Vienna; ambass. to Turkey (1939-41); tried by Allies as war

PAPER SIZES, SUBDIVISIONS, AND QUANTITIES

WRITINGS AND PRINTINGS

(All cut edges)

Name	Size, ins.
Crown	15 × 20
Crown, Double	20 × 30
Crown, Quad	30 × 40
Crown, Double Quad	40 × 60
Small Demy	15½ × 20
Small Demy, Double	20 × 31
Small Demy, Quad	31 × 40
Demy (printing)	17½ × 22½
Demy (writing)	15½ × 20
Demy, Double (printing)	22½ × 35
Demy, Double (writing)	20 × 31
Demy, Quad	35 × 45
Emperor	48 × 72
Elephant	23 × 28
Foolscap	13½ × 17
Foolscap, Double (printing)	17 × 27
Foolscap, Double (writing)	16½ × 26½
Foolscap, Quad	27 × 34
Foolscap, 1½ sheet	13½ × 22½
Foolscap, 1¼ sheet	13½ × 25½
Imperial	22 × 30
Imperial, Double	30 × 44
Imperial, 1½ sheet	22 × 45
Medium	18 × 23
Medium, Double	23 × 30
Post	15½ × 19
Post, Double	10 × 30½
Post, Sheet and ½	104 × 23½
Large Post	16½ × 21
Large Post, Double	21 × 33
Small Royal	10 × 24
Royal (printing)	20 × 25
Royal (writing)	19 × 24

Name	Size, ins.
Royal, Double	25 × 40
Large Royal	20½ × 27½
Large Royal, Double	27½ × 41

NOTE.—All double and quad sizes in the above are exact multiples of the standard sizes. These designations also apply to cover papers, the sizes of which are, however, slightly larger.

SUBDIVISIONS

There are three kinds of subdivisions of paper; ordinary, long, and irregular; the latter two are usual only for special printing purposes (brochures, and similar productions). Here is given the ordinary kind most commonly met with.

Subdivisions are found by dividing one or both the dimensions of a standard sheet (see list above).

Folio: Divide long dimension by 2; thus one fold produces 4 pages.

Quarto (4to): Divide both dimensions by 2, thus two folds produce 8 pages.

Octavo (8vo): Divide long dimensions by 4, short by 2, thus three folds produce 16 pages.

Sexto-decimo (16mo): Divide both dimensions by 4; thus four folds produce 32 pages.

Trigesimo-seculo (32mo): Divide long dimension by 8, short by 4; thus five folds produce 64 pages.

Examples: Demy 17½ ins. × 22½ ins.; demy folio, 11½ ins. × 17½ ins.; demy 4to, 8½ ins. × 11½ ins.; demy 8vo 5½ ins. × 8½ ins.; demy 16mo, 4½ ins. × 5½ ins.; demy 32mo, 2½ ins. × 4½ ins.

QUANTITIES

24, 26, or		480, 500, or	
27 sheets	= 1 quire	516 sheets	= 1 ream
20 quires	= 1 ream	2 reams	= 1 bundle
	5 bundles		= 1 bale

PAPER

criminal at Nuremberg (1945-46) and acquitted, but sentenced by Germans to 8 yrs. in a labour camp, released 1949.

Paper, 6-62, 65-68 illus.; china clay in 2-377; produced by Chinosa, 2-2; introduced to Europe by Mahomedana, 5-89; sizes, 2-4. *See also* table in preceding page.

Paper Birch. A species of birch from which birchbark canoes are made.

Paper-board, or cardboard, uses of, 6-62.

Paper Dolls, 3-104.

Paper Mulberry. Tree; young shoots used in Japan for paper-making, 5-290, 6-29.

Paper Nautilus. *See* Argonaut.

Paper Sizes, printing paper, 2-4. *See also* Paper (table).

Paphos [pa'fɔs]. Name of 2 anc. cities on w. coast of Isl. of Cyprus; Old Paphos, founded about 10th cent. B.C., was chief seat of worship of Aphrodite; New Paphos was cap. of Isl. in Rom. times.

Papier Mâché [pa'pyä ma'shë]. Paper product resembling wood, made by mixing paper pulp and compressing it in a mould; boxes, buttons, vases, trays, and other articles are made with it, 6-62, 2-5 illus.

Papin [pa'pin], Denis (1647-1712). Fr. physicist, greatly improved air pump, conceived idea of pneumatic transmission of power, invented the steam digester, 7-152.

Papineau [pa'pinö], Louis Joseph (1786-1871). Leader of Fr.-Canadian rebellion of 1837; his ideas of reform aimed at the complete independence of Fr. Canada, 6-321.

Papoose. Red Indian baby, 6-373.

Paprika. Variety of pepper, 6-121.

Papua [pa'pua]. Territory of, S.E. New Guinea and neighboring isls.; 90,540 sq. m.; est. pop. 338,800; admin. by Australia; formerly called Brit. New Guinea; name also applied to New Guinea as a whole, 1-319, 5-396; in 2nd World, 7-493.

Papuans. People of New Guinea, 5-396.

Papyrus. MSN. written on rolls of papyrus, 2-1, 2-90.

Papyrus. Reed formerly cultivated in Nile delta and used for making a kind of paper, 6-71, 2-1, 6-62; papyrus in Brit. Museum, 2-90.

Par. *See* Stock Exchange Terms.

Par, in golf, 4-16.

Para. *See* Money (list).

Pará (Brazil). *See* Belém.

Pará. It. of Brazil; estuary of the Tocantins and also one of mouths of the Amazon.

Parables. Short allegories designed to illustrate moral truths of Jesus Christ, 4-364.

Paracelsus [para'sel'sus]. Assumed name of Theophrastus Bombastus von Hohenheim (1493-1541). German Swiss physician and chemist; his theories were advanced for his age; burns Galen's works, 3-498.

Parachute, 6-72; parachute rockets, 6-122; parachute troops, 7-490, 6-72, 73, 74 illus.; Degan's parachute machine, 1-31, 28 illus.

Parachute Regiment. In British army, 1-252.

Parachute Troops, 6-72, 73, 74 illus.; 7-497 illus. *See also* Airborne Forces.

Paradise. Birds of, 6-76, 77 illus. f.

Paradise Lost. Great epic poem by Milton; story retold, 5-211.

Paradise Regained. Epic poem by Milton, 5-211.

Paraffin Lamp, 4-443 illus.

Paraffin Oil or Kerosene fuel in jet engine, 4-371.

Paraffin Series. In chemistry, 2-319.

Paraffin Wax. A white wax obtained from petroleum, coal-tar, and shale oils, 7-432.

Paragonite. Type of mica, 5-190.

Paraguay. Republic of S. Amer.; area (excluding the Gran Chaco) 61,703 sq. m.; pop. 1,450,637. Cap. Asunción, 6-76; flag, 2-385 illus. f.; and Argentina, 1-226; War of 1865-70, and Brazil, 2-49; Bolivia and Chaco War, 1-567.

Paraguay River. Chief tributary of the Paraná; rises in S.W. Brazil, flows S. through Paraguay; length about 1,500 m.; chief commercial outlet for Paraguay, 1-224, 6-76.

Paraguay Tea. *See* Yerba Maté.

Paraldehyde, an anesthetic, 1-143.

Parallel. Term in electrical engineering to describe two or more conductors so connected that when current flows in the circuit it is divided between them. Cells are arranged in parallel by connecting all the negative terminals to one common lead and all the positive terminals are connected to another common lead, 3-212 (diag.).

Parallel. Term in geometry to describe straight lines in a plane which do not meet however indefinitely they are extended, i.e. they always remain at the same distance from each other.

Parallelogram of Forces, 5-156 illus.

Parallel Roads, in Glen Roy, Inverness-shire, Scot., 4-275.

Parallels, of latitude, 4-452 with diag.

Paralysis, and damaged nerves, 5-369.

Para-magnetic Materials. Weak magnetic substances, 5-83 with diag.

Paramaribo [para'maribö]. Cap. and trade centre of Surinam, S. Amer.; pop. 80,000; on estuary of r. Surinam, 17 m. from sea; good harbour, 4-102.

Paramecium. Protozoan animal, 1-151 illus.

Paraná [para'nah']. 2nd largest r. of S. Amer.; rises in S.-cent. Brazil; flows S.W. nearly 2,000 m., 1-224, 6-76.

Par'apet, in architecture, a wall raised breast-high; the upper part of a wall, bridge, balcony, or terrace; the upper part of a house which is above the springing of a roof and guards the gutter.

Parasites, 6-77; bracket fungi, 3-489; mistletoe, 6-238; moulds and mildews, 5-284; among plants, 5-444, 6-215, 1-447; rust fungus, 6-181.

Parasol (sunshade). Umbrella that gives protection from the sun, 7-345.

Parasol Ants. Leaf-cutting ants of tropical America; genus *Atta*; their "mushroom gardens," 1-162 illus.

Parathyroid Glands, 4-25.

Par'avane. Device to protect ships from moored contact mines, 5-220 illus., 221.

Parcae [pah'rë]. Latin name for the three Fates who ruled the destiny of Man.

Parachment. Writing material made from skins of sheep, goats, and calves, 6-62.

Parachment Lactarius, a fungus, 3-188 illus. f.

Pardon, for prisoners; in Gt. Brit. this right rests solely with the sovereign, who is advised by the home secretary.

Pardon, The, old custom in Brittany, 2-90.

Paré, Ambroise (1510-90). Fr. surgeon to four kings; saved Charles IX on St. Bartholomew's Eve; first to use artery ligatures after amputations; 7-194; portrait, 5-164 illus.

Paragoric. Compound tincture of camphor, for coughs (from Gk. words soothing, speaking), 2-192.

Parenchyma [para'nkima]. Parent tissue of plants.

Parentheses, in punctuation, 6-309.

Par'etting [pah'r'etjng]. In architecture, various kinds of plaster-work, notably decorative plaster-work in raised ornamental figures, largely used in internal and external decoration of 16th and 17th cent. houses; at Saffron Walden, 3-298 illus. Also smooth chimney lining.

Pariahs [pah'riaz]. Outcasts among Hindus.

Parian Marble. Variety of marble used for sculpture, 5-121.

Paris. Trojan prince in Homer's *Iliad* in story, 7-320, 4-189.

Paris, Henri, Comte de (b. 1908). Claimant to French throne; in Bourbon line, 2-28.

PAROS

Paris, Matthew (d. 1259). Eng. monk of St. Alban's Abbey; with Roger of Wendover wrote chronicle in 13th cent., 4-181.

Paris. Cap. of France; pop. 2,830,000; 6-79, 3-438; air view, 6-82 illus.; exhibitions, 3-327; fire brigade, 2-363; Institute for the Deaf, 3-66; the Louvre, 5-45; under Philip II, 6-155; capture of Bastille (1789), 2-467; siege of (1871), 2-459; open-air café, 6-85 illus. f.; university, Abélard and, 1-3; as European model, 7-368.

Paris, Peace of (1763), and end of Seven Years' War, 7-4.

Paris, Treaties of (1783), 1-139, (1856), 1-481.

Paris, University of. One of the largest and oldest universities in the world; important in Middle Ages, gradually declined until abolished at Fr. Rev.; re-established in 1896; faculties of letters, science, theology, law, medicine; 6-85, 7-368.

Par'ish, unit of local govt., originally ecclesiastical; several parishes are combined to form rural or urban dists.; 4-53.

Parish Council. Formed in parishes of 300 pop. and upwards. If under, parish meeting (which cannot levy a rate) usually performs local business.

Park, Mungo (1771-1806). Brit. (Scot.) surgeon and explorer in Africa, 6-86; discovery of Niger's course, 5-434, 1-54.

Parker, Sir Gilbert (1862-1932). Brit. novelist and politician, b. in Canada, M.P. 1900-18; among his best-known books are *Peter and His People*, *The Right of Way*, *The Seats of the Mighty*.

Parker, Sir Hyde (1714-82). Brit. vice admiral; fought a fierce and decisive battle with the Dutch off Dogger Bank in 1781.

Parker, Sir Hyde (1739-1807). Brit. admiral, second son of above, fought in the War of Amer. Independence; he was in command of the bombardment of Copenhagen in 1801, when Nelson's victory, following his refusal to act on Parker's signal to withdraw (the famous "blind eye" incident), led to the latter's recall; 5-363.

Park Lane. Fashionable thoroughfare in London, extending between Piccadilly and Marble Arch, bordered on W. by Hyde Park and E. by Mayfair; once notable for palatial mansions, now mostly hotels; 5-26, 27 illus.

Parlement of Paris. Supreme royal tribunal of Fr., originating in medieval court; through registration of laws exercised influence over king; abolished in 1790.

Parliament, in Gt. Brit., 6-86; development from King's Council, 3-277; Simon de Montfort and, 5-2-2; Cromwell and, 2-533; Model Parliament, 3-187; and standing army, 1-248; cabinet, 2-151, and constitution, 4-50; elections, 3-208, politics, 6-254; voting for, 7-407; war with Charles I., 2-307.

Parliament, in Canada, 2-201; in Australia, 1-318; in Iceland, 4-233; in Poland, 6-240.

Parliament, Houses of, London, 5-2; 24 illus., 6-87, 89 illus.; Parliament Square, 7-353 illus.

Parliament, Members of, duties, 6-90; qualification for election, 3-208.

Parma. Tn. 88 m. N.W. of Florence, It. on r. Parma; pop. 123,000; various mfrs., farming trade; famous works; university.

Parma and Piacenza, Duchy of, and House of Bourbon, 2-28.

Parmesan, type of hard cheese, 2-31.

Parnassus, Mt. (modern Liakouras), cent. Greece, sacred to Apollo and Muses.

Parnell, Charles Stewart (1846-91). Irish political leader, 6-91.

Par'nos, Mount. *See* Ossa Mount.

Paros [pah'rɔs] or Paro. Gk. Isl. Cyclades group in Aegean Sea W. of Naxos; 96 sq. m.; formed by Mt. Elias (2,500 ft.); celebrated white marble quarries.

PARR

Parr. A young salmon; appearance, 6-489.

Parr, Catherine (queen of Henry VIII). See Catherine Parr.

Parrakeet. Name given to many small long-tailed parrots, including bud gorilla, 6-92.

Parramatta, r. of N.S.W., Australia. Macarthur's sheep station, 1-318.

Par'rot. R. of Dorset and Somerset flowing 35 m. to the Bristol Channel, 7-84.

Parthasius [pará'sius]. Gk. painter of 4th cent., first master of correct drawing, and first to use light and shade to express round form; won contest with Zenxis; 4-89.

Parrot Fish. Tropical fish, 5-128 illus. 1.

Parrots. 6-92, 5-61.

Parry, Sir Charles Hubert Hastings, Bart. (1848-1918). Brit. composer; series of great choral works with orchestra; 5-306.

Parry, Sir William Edward (1790-1855). Brit. Arctic explorer; made three attempts to find North-West Passage; in 1827 tried to reach North Pole, attaining latitude 82° 45' N., which remained for 49 years the farthest north reached by explorers.

Parry, in fencing. 3-316.

Parsec. Unit used in astronomy for measuring stellar distance; one parsec 3-26 light years, or 192 million million miles.

Parsees. Followers of the Zoroastrian religion, living in N. and W. India, and some dists. of Persia, 6-92, 4-241; in Bombay, 1-515.

Par'sifal [pah'sifal]. Father of Lohengrin; subject of opera by Wagner, 7-409.

Parsley. A herb with aromatic leaves; several kinds grow wild in Britain; all have deeply cut leaves and umbels of very numerous, very small white flowers.

Parsley family, or Umbelliferae. A family of herbs with umbrella-shaped clusters of small flowers; includes carrot, celery, parsley and parsnip.

Parsnip. A root vegetable, 6-93.

Parsons, Sir Charles Algernon (1854-1931). Brit. engineer; creator of the steam turbine, 7-330; developed the searchlight; improved manufacture of optical glass; and synthetic diamonds, 3-84.

Parsons Steam Turbine. 7-330 with illus.

Parthenogen esis. Reproduction from unfertilized egg cells; in aphids, 1-183; among insects, 4-269.

Parthenon. Temple of Athens at Athens, 1-3, 1-210 illus.; Elgin marbles, 3-228, 229 illus.; Parthenon frieze, 2-89 illus., 4-90 illus.; Phidias and, 6-153; bomb damage, 4-78.

Parthenopæan Republic. Republican state formed at Naples in 1799 after expulsion of the Bourbons. Overthrown in 1800; Naples cap. of, 5-318.

Parthia [pah'rthia]. Anc. country of Asia, S.E. of Caspian Sea; most extensive sway under Mithridates I; 6-131. Parthians' favourite tactics were to discharge arrows as they retreated—hence "Parthian shot", 1-207.

Partisan. Weapon carried by Yeoman of the Guard, 1-410.

Partition of Poland. 6-240.

Partridge, Sir Bernard (1861-1945). Brit. black-and-white artist, contributor to *Punch* for over 50 years. Drow over 8,400 cartoons, excelling in the heroic, monumental style.

Partridge. A game bird, 6-93; protective coloration, 6-296.

Parts of Speech, in grammar. 4-55.

Pasadena, Calif., U.S.A. Residential city and winter resort, 8 m. N.E. of Los Angeles; pop. 104,100; founded in 1882; fruit-growing and mig. centre.

Pasargadae [pasahr'gādē]. Anc. cap. of Persia, said to have been built by Cyrus the Great on site of his great victory over Astyages (4th cent. B.C.); contained tomb of Cyrus.

PAULHAN

Pascal, Blaise (1623-62). Fr. philosopher, mathematician, and physicist, 3-455; experiments with air pressure, 1-371; invents first calculating machine, 2-167; experiments in hydraulics, 4-214; and theory of probability, 5-117; portrait, 5-148.

Paschal Lamb. Sacrificial lamb of Jewish Passover; and Easter, 3-154.

Pascoli, Giovanni (1855-1912). Italian poet, 4-330.

Pasha. Title in old Turkey and Ottoman Empire for provincial governors military commanders, etc.

Pasque Flower, or Easter Anemone. 1-150.

Passau [pa'sow]. Old town of Bavaria, Ger., at junction of Danube, Inn, and Ilse, and at border of Austria, pop. 25,150; treaty of Passau (1552) granted religious freedom to Lutherans.

Paschendale [Flem. pron. pah'sken-dah'le] Ridge. Height 6 m. N.E. of Ypres; 1st World War battles, 7-481 illus.

Passerines [pas'arēz]. Perching birds.

Passion Flower, *Passiflora*. Climbing plant, chiefly found in hotter parts of America; the solitary flowers are blue, purple, red, or white and about 2 in. across; name derived from resemblance of flower to symbols of Christ's passion; stigmas represent nails of the cross, the corona the crown of thorns; pollen grains, 3-399 illus.

Passionists (Congregation of the Blessed Clerks of the Most Holy Cross and Passion of our Lord Jesus Christ). Religious order founded in Italy about 1730.

Passion Play. Dramatic representation of sufferings of Christ; first given by villagers of Oberammergau in 17th cent. in gratitude for escape from plague of 1633; 5-190.

Passive Resistance or Non-Co-operation. Doctrine of peaceful rebellion against British rule in India, taught in Gandhi; 3-500.

Passos, John Dos (b. 1878). Amer. novelist, 7-366.

Passover. Jewish festival, 6-94; and Easter, 3-154; the Last Supper 4-367.

Pastern, of horse. 4-196 diag.

Pasternak, Boris (b. 1890). Russ. poet 6-481.

Pasteur, Louis (1822-95). Fr. chemist and bacteriologist 6-94, 3-431; and germs, 7-194; and polarized light 7-228; pasteurisation, 2-212, 5-207.

Pasteurisation, method of suspending bacterial activity, devised by Pasteur. 6-95, 2-212; of milk, 5-207.

Pastry, home-baking. 2-497.

Patagonia. Southern part of S. Amer., mainly in the Argentine but also partly in Chile; Chilean section 70,000 sq. m.; Argentine section 300,000 sq. m., 6-96, 2-357, 7-96.

Patala [patah'la]. In Hinduism, the abode of evil spirits.

Patching, in sewing. 7-8.

Pâté de foie gras. Pate made from chopped goose livers mixed with spices, 4-46.

Patella. Bone, in skeleton, 1-144 diag.

Pater, Walter (1839-94). Brit. essayist and critic; his over-refined style and cult of beauty influenced the "decadents" of late 19th cent.; *Marius the Epicurean* (1885), 3-291.

Paternoster Row, London: origin of name, 5-21.

Paterson, A. B. (Banjo) (1864-1941). Australian poet, 1-321.

Paterson, William (1658-1719). Scottish financier; promoter of a disastrous attempt to colonise Darien (Panama) in 1698; and Bank of England, 1-361.

Paterson, New Jersey, U.S.A. Important silk industry; mfrs. locomotives, aeroplanes, textiles; pop. 139,336.

Pathans [patahnz]. Persian tribes of S. Afghanistan and N.W. Frontier Prov., Pakistan.

Pathology. Science dealing with disease, 7-195, 5-185. See also Disease; Germs in Disease.

Patiala. City and cap. of Patiala and E. Punjab States Union, Rep. of India, pop. 10,000, 4-241.

Patiala and E. Punjab States Union. Union of predominantly Sikh states in repub. of India, formed in 1948; area 10,099 sq. m.; pop. 3,408,631; cap. Patiala, 4-241.

Patient Griselda. The Clerk's Tale in Chaucer's *Canterbury Tales*, 2-313.

Patnir, Joachim de (c. 1475-1524). Flemish artist, 5-381.

Patio [pah'tō]. Inner court of a Sp. or Sp.-Amer. dwelling.

Pat'more, Coventry (1823-96). Brit. poet and critic (*The Angel in the House*; *The Unknown Eros* odes of exalted thought expressed in rich, dignified melody).

Pat'mos. Bare volcanic isl., one of the Sporades in Aegean Sea; here St. John (the Evangelist) lived for 18 months in exile, and here he is said to have written the Apocalypse.

Patna. Chief city of Bihar state, Rep. of India, on Ganges; pop. 202,057; rice, opium, indigo; univ. (founded 1917); massacre of Patna (1763), and Indian Mutiny (1857), 1-445; Patna rice, 3-501.

Patras [pah'trahz]. Greece. Fortified spt. and trade centre on W. coast of Gulf of Patras; pop. 83,000; one of 12 Achaean cities; early centre of Christianity, 4-29.

Patricians. Wealthy, aristocratic citizens in anc. Rome, 6-129.

Patrick, Saint (c. A.D. 385-160). Patron saint of Ireland, 6-96.

Patna, in India. 1-445; monasteries founded, 3-243; and Shinto, 7-1.

Patroclus. In the *Iliad*, the son of Menelaus and friend of Achilles, 1-10, 7-320.

Patrol, of Boy Scouts. 2-33.

Patrol Boat. Type of warship, 5-44.

Patterson, Elizabeth (1785-1879). First wife of Jerome Bonaparte, 1-517.

Patterson, G. L., Australian tennis player; introduced "cannon ball" service (1919), 4-162.

Patti, Adelina, Baroness Cederström (1843-1919). Operatic soprano celebrated for her wonderfully pure voice, which kept its freshness even in her later years; made debut as "Lucia" in New York city at 16.

Pattin, Gen. George Smith (1885-1915). Commandant U.S. 7th Army in N. Africa 1942-43, and in Sicily 1943; led U.S. 3rd Army's advance across France and Germany 1944-45.

Paul. Tn. and winter resort of Fr., capital of Basses-Pyrénées; pop. 10,200, 6-314.

Paul, St. (d. c. A.D. 67). The "Apostle of the Gentiles," first great Christian missionary (name originally Saul) 6-97; his journeys, 6-98 map; missions, 2-379; and Maltese tradition, 5-98.

Paul III (Alexander Farnese) (1549-1590). Pope, elected 1551, excommunicated Henry VIII of England; commissioned Michelangelo to paint *The Last Judgment*.

Paul IV (Giovanni Pietro Caraffa) (1550-1559). Pope, elected 1555; opposed Reformation and made breach between Churches of England and Rome irreconcilable.

Paul I, King of Greece (b. 1901). Succeeded to throne, April 1917, 4-78.

Paul I (1754-1801). Tsar of Russia, succeeded his mother, Catherine II in 1796; cruel despot and madman, assassinated by conspiracy of nobles.

Paul, Prince (b. 1893). Regent of Yugoslavia 1934-41, during the minority of King Peter, overthrown March 1941 by *coup d'état*, after signing an agreement with Hitler; fled to Athens and later Kenya.

Paul, Epistles of. Books in New Testament comprising 13 letters attributed to St. Paul, though authorship of some doubtful, 6-99.

Paul of Thebes (3rd cent. A.D.). Famous hermit, 5-243.

Paulhan, Louis (b. 1884). Fr. aviator; one of the pioneers of flying; in 1910 won *Daily Mail* £10,000 prize for 1st London to Manchester flight.

PAULINUS

Paulinus (353-431). Bishop of Nola; and first church built, 1-121.
Paul Jones. Dance, named after John Paul Jones, Amer. naval hero. 4-381.
Paul's Scarlet Climber. Variety of rose, 6-453 illus. f.
Paulus (paw'loos). Friedrich von (b. 1890). Ger. soldier; commanded 6th army at Stalingrad, and was captured there Jan. 1943; denounced Nazis from Russ.; returned to E. Ger. 1953.
Paunch or Rumen. First stomach of a ruminant, 6-471.
Pausanias (2nd cent. A.D.). (Gk. traveler, geographer, and writer on art, 4-61; description of Acropolis, 1-13.
Pavia (pay've'ah) (anc. Ticinum). City of N. Italy, 18 m. S. of Milan on r. Ticino; pop. 81,700; univ.; cap. of Lombard kingdom; taken by Charlemagne in 774; defeat of Francis I, 4-311.
Pavlov (pahv'lof). Ivan Petrovich (1849-1936). Russ. psychologist; devoted much time and thought to behaviour of animals ("conditioned reflex") in order to apply knowledge to human beings.
Pavlova (pahv'lova), Anna (1885-1931). Russian dancer; debut London, 1909; unexcelled in classical style of ballet-dancing; most famous dance "Le Cygne" (The Swan) 1-352.
Pawna, in chess, 2-330.
Pawtucket. Tn. in Rhode Isl., U.S.A.; pop. 81,180, 6-392.
Paxton, Sir Joseph (1801-65). Brit. gardener and architect; and Crystal Palace, 1 217, 3-327 with illus.
P.A.Y.E. Pay-as-you-earn system of income tax payments, introduced in Great Brit. in 1911, 7-231.
Pay's, Hugh de. Burgundian knight who in 1118 undertook with Godfrey de St. Omer the work of protecting the pilgrims who, after the first crusade, flocked to the Holy Land; thus originated the Knights Templars, 4-118.
Paymaster-General. Brit. unpaid govt. official; office dates from Restoration, but was reorganized in 1835 and 1848; pays out money required by govt. depts.; member of the govt., but not in cabinet.
Pea. Plants of the *Laguminosae* family, 6-99; protein in, 6-297.
Peaberry Coffee, 2-445.
Peabody, George (1795-1869). Amer. banker and philanthropist. Founded and endowed numerous institutions and museums in U.S. Gave \$150,000 to the London poor, and £500,000 to establish the Peabody buildings (blocks of low-rental flats) in London; Peabody Museum, Harvard, 5-301.
Peace Conference (1919) at Versailles, 7-484.
Peace River, in Alberta, Canada, rises in W. of Rocky Mts. and flows E. to junction with Slave r.; more than 1,000 m. long, 1-93, 5-61.
Peach. Fruit (*Prunus persica*), 6-99. fruit and blossom, 3-182 illus.
Peacock, Thomas Love (1785-1866). Brit. satirical novelist and poet, friend of Shelley and father-in-law of George Meredith (*Nightmare Abbey*; *Crotchet Castle*).
Peacock. Bird (*Pavo cristatus*), 6-100, 101 illus. f.; sacred to Juno, 4-386.
Peacock butterfly, 2-139 illus.
Peacock Pheasants, courtship, 1-457 illus.
Peacock's Tail. Species of algae, 1-104 illus. f.
Pear. Fruit (*Pyrus communis*), 6-100, blossom and fruit, 3-393, 481 illus.; in botany, 2-24; perry, 2-388.
Pearl Ash. See *Potash*.
Pearl Barley, 1-369.

Pearl-bordered Fritillary butterfly, 2-141 illus.
Pearl Harbour. Port of Oahu, Hawaiian Is.; Japanese attack on, 6-100, 4-140, 7-491, 6-101, 4-350.
Pearl Mosque. Building at Agra, 1-69.
Pearl River (China). See *Chu-kiang*.
Pearls, 6-101; Bahrain fisheries, 6-135; diver of anc. Greece, 4-78 illus.; cause of iridescence, 2-463; in mussel, 2-437; synthetic pearls, 4-373.
Pear Slug, a pest, 6-501.
Pearson, Sir Cyril Arthur (1866-1921). Brit. journalist and newspaper proprietor; founded *Pearson's Weekly* and other periodicals and started the *Daily Express*; became blind and subsequently devoted himself to the welfare of blind people especially as first chairman of St. Dunstan's, organization for those blinded in war.
Peary, Robert Edwin (1856-1920). Amer. polar explorer; first man to reach North Pole, 6-103, 6-241, 5-160 illus. 1-220.
Peasants' Revolt, in England (1381), 7-339, 7-505.
Peasants' War, in Ger. history, 4-8; and social discontent in Ger., 6-376.
Peat. Partly carbonised vegetable material used as fuel, 6-103, 3-186; formed by bog moss deposits, 5-273; in coal formation, 2-426; in Ireland, 4-281, 284 illus.
Pecan. N. Amer. tree of the hickory family producing nuts.
Pecary. Small wild hog of N. and S. Amer.; the northern, collared pecary, is about 3 ft. long and the southern white-tipped pecary a few ins. longer, 7-97 illus.; foot, 3-413 illus.
Pechelbronn, Alsace-Lorraine, oilfield, 1-127.
Pechora. R. of N. Russia, rising in Ural Mts. and flowing 970 m. to N. coast, 3-309.
Peck. A fourth part of a bushel. See *Weights and Measures*.
Pecos. R. of U.S.A., chief tributary of Rio Grande; rises in New Mexico at base of Baldy Peak; flows S. and S.E. 800 m. entering Rio Grande on Texas-Mexican border.
Pécs (pách) (Ger. Feunkirchen). Tn. of Hungary; pop. 70,000; fine medieval cathedral; makes woollens, leather, paper, porcelain; surrounding vineyards produce famous wine.
Peetin. Substance which causes fruit to jelly when boiled with sugar; in jam-making, 4-336.
Pedagogue, learned word for teacher, origin of word, 3-166.
Pedestrian Crossing. Defined path on which persons wishing to cross a public road have certain rights over vehicular traffic. The first in the U.K., introduced 1934, was a "lane" bounded by metal studs and marked by a Bellisha Beacon (q.v.). Replaced in 1952 by diagonally-striped "zebra" crossing which in 1953 was marked by flashing, lemon coloured beacons.
Pedestrian Carriole. Early form of bicycle, 3-14 with illus., 7-412 illus. f.
Pedigree Dogs; Kennel Club register, 3-103, 104.
Pediment. In classical architecture, triangular-shaped portion of wall above the cornice, corresponding to gable in Gothic architecture.
Pedipalp. Grasping claw of arachnids.
Pedriarías (Pedro Alías de Ayala), gov. of Darlen; and Balboa, 1-348.
Pedro III (1236-86). King of Aragon; called "the Great" because of success in conquering Sicily.
Pedro I (1798-1834). Emperor of Brazil, son of John VI of Portugal, crowned in 1822; succeeded to Port. crown in 1826, and at once resigned it to his daughter Maria da Gloria; abdicated Brazilian crown in 1831; died after restoring his daughter to Port. throne, 2-49.
Pedro II (1825-91). Emperor of Brazil, succeeded in 1831; compelled to abdicate in 1889, prosperous reign notable for emancipation of slaves, and war (1864-70) with Paraguay 2-49.

PELICAN

Pedro I, the Cruel (1333-69). King of Castile and Leon; succeeded 1350; provoked rebellion of his brother Henry, by whom he was killed.
Pedro V (1837-61). King of Portugal; succeeded in 1853; reign marked by freedom from civil strife and by economic improvement.
Pedrotalagalla. Highest peak in Ceylon (8,326 ft.), 2-297.
Peelshire. Co. tn. of Peebles-shire, Scot.; pop. 6,013; cloth mfrs. 6-104.
Peebles-shire. Inland co. of S.E. Scotland; area 317 sq. m.; pop. 15,226; 6-104.
Peel. Tn. in Isle of Man; pop. 2,582. Peel castle, 5-110 with illus.
Peel, John (1776-1854). Brit. huntsman; a renowned hunter of the fox in his native Cumberland; immortalised in John Graves's song "D'ye ken John Peel?"
Peel, Sir Robert (1788-1850). Brit. statesman, 6-105; and Gladstone 4-26; and police, 6-247 18.
Peels, George (1558-98). Eng. dramatist and poet (*The Old Wives Tale*; *The Love of King David and Fair Bathsheba*); shares with Marlowe credit for improving English dramatic diction and making blank verse smoother, 3-118, 3-285.
"Peeler". Former Eng. nickname for policeman; derived from Sir Robert Peel.
Peenemünde (pé'nemünde). Ger. research station for flying bombs, rockets, radio-location, etc., on Baltic Sea, 60 m. N.W. of Stettin; occupied May 1945 by Russ., who continued researches.
Peeping Tom. The man who looked at Lady Godiva, 2-522.
Peenrge, 6-106.
Peers, in Brit. peerage, 6-106.
Peewit. See *Plover*.
Pegasus. In Gk. myth., winged horse named by Hippocoon, 6-106.
Pegmatite, coarse grained granite, field of m. 3-345.
Pégoud, Adolphe (1857-1915). Fr. aviator; first man to fly upside down and to loop the loop (1913), 1-11.
Pehlevi. Persian language, 6-132.
Peihai (pé'hái). Important r. of N. China; rises N. of Peking, flows S. 350 m. to Gulf of Bohai.
Peiping. See *Peking*.
Peipus. Lake of U.S.S.R., 120 m. S.W. of Leningrad on L. Estonian bound ary, drains into Gulf of Finland through r. Narova; 1,356 sq. m. rich fisheries, 3-298.
Peishan. Mt. peak in Korea over 8,000 ft., 4-425.
Peisistratus or Pisistratus. Greek tyrant and Athenian theatre, 3-116.
Pekan. See *Black Marten*.
Pekinese. Breed of dog, 3-101, 100 illus. f.
Peking. Cap. of China, est. pop. 3,000,000, 6-107.
Peking Man. Name given to prehistoric skull found near Peking, 5-101 10, illus.
Pelagic Fish. Salt water fish living between the middle depths and the surface, 3-379.
Pelagosa. Is. of Adriatic, midway between Gargano and Dalmatia, ceded by It. to Yugoslavia under peace treaty of 1947.
Pelargonium. The so-called "geranium," most popular of pot-plants, 3-524 with illus.
Pelagians ("Sea-people"). Inhabitants of Greece before Greeks, 4-71.
Pelée, Mont. Volcano in Martinique, 4,500 ft., 7-105 illus. f. eruption in 1902, 5-138.
Peleus (pé'lús). In Gk. myth., husband of Thetis and father of Achilles, marriage feast, 7-320, 1-10.
Pelaw (pé'law) or **Pelau Islands**. Group of 26 small fertile isls. in Pacific I. (Philippines); discovered by Spaniards (1513); sold to Ger. (1899); seized by Japan in 1914, 6-26.
Pelias. In Gk. myth., son of Poseidon and king of Iolcus; sends Jason in search of Golden Fleece. See *Argonauts*; *Medea*.
Pelican. Bird, 6-108, 1-471 illus.

PELICAN'S FOOT

Pelican's Foot. A mollusc, 5-233 illus. f.
Péligot, Eugène. Fr. scientist who in 1842 first isolated uranium, 7-370.
Pelion (pé'lon), Mt. Lofly mt. range in Thessaly, Greece, celebrated in myth.; had temple to Zeus and cave of centaur Chiron; giants are said to have attempted to pile Pelion and Ossa on Olympus, to reach the sky; ship *Argo* built from wood grown on its slopes.
Pellagra. An ailment common in maize-eating countries caused by lack of vitamin B, 7-401.
Pelléas and Mélisande. Opera by Debussy; story, 5-519.
Peloponnesian Wars (431-404 B.C.). In Gk. hist. wars between Sparta and Athens, 4-77, 7-124; Pericles and, 6-125; Thucyd., 7-266; Thucydides and Athenian fleet, 7-271.
Peloponnesus (pelopon'nesus). Anc. name of s. Greece (modern Morea).
Pelops (pel'ops). In Gk. myth., son of Tantalus, king of Phrygia, and father of Arctus and Thyestes; Pelops's lue was cursed by Myrtilus, the charioteer to whom he refused to pay a promised bribe.
Pelota. Ball game of Basque origin, played in Spain and Spanish Amer. A hard ball, made of rubber and wire mesh covered with leather, weighing about 4 oz., struck with a hollow grooved scoop strapped to player's hand, is kept in motion against two walls at right angles to each other; there are three players on each side.
Pelt. Name given to a skin when hair has been removed, 4-467.
Peltate. Bot. term for a leaf type in which the petiole comes up into the centre of the blade, e.g. nasturtium, 4-471.
Peltier Effect. Phenomenon in electricity whereby heat is liberated or absorbed at a junction where an electric current is passed from one metal to another. See also Seebeck Effect.
Pelusium (pelu'shi-um). Anc. fortified city of Eg. at N.E. extremity of Delta of Nile; gave name to m. mouth of Nile; important point in wars between Eg. and Sennacherib, Cambyses, Antiochus, and other Eastern monarchs.
Pelvis, bone in skeleton, 1-144 diag.
Pemba. Isl. of the Zanzibar Protectorate, off the e. coast of Africa; about 380 sq. m.; pop. 100,000.
Pemberton, Sir Max (1863-1950). Brit. novelist and playwright; author of many successful adventure romances *The Iron Gate*, *Kronstadt*.
Pembroke, Mary Sidney, Countess of (1561-1621). Sister of Sir Philip Sidney, for whom he wrote *The Countess of Pembroke's Arcadia*; subject of Ben Jonson's famous epitaph on "Sidney's sister, Pembroke's mother."
Pembroke. Tn. on s. shore of Milford Haven, Pembrokeshire, Wales; pop. 12,296; castle, 6-110 illus.
Pembroke College, Cambridge Univ., 2-182.
Pembroke College, Oxford Univ., 6-18.
Pembrokeshire. Co. of Wales; area 614 sq. m.; pop. 87,206; co. tn. Haverfordwest, 6-110.
Pemmican. Amer. Indian food prepared from dried bison meat, 1-476.
Pen, 6-111; quill, 2-3; reed, 2-1.
Penalty. In games; in football, 3-415; in hockey, 4-184.
Penance. Act of self-mortification as an expression of repentance for a sin committed; one of the sacraments of the Rom. Cath. Church.
Penang. State of Federation of Malaya; area 400 sq. m.; pop. 446,321; comprises isl. of Penang and dist. Province Wellesley on mainland; 5-94, 95 illus.
Penates (penát'ez). Rom. gods of the household; each family worshipped its own Penates, which seem to have varied in different families; worship connected with that of Vesta.
Penell, 6-113.
P.E.N. Club. Literary association with centres in many countries.

Concerned with friendliness between writers all over the world, regardless of colour politics, religion. Initials indicate Poets and Playwrights, Editors and Essayists, and Novelists.
Pendulum, 6-114; in clocks, 2-413, 417; Galileo's observations, 3-499.
Pendulum Clock, force of gravity working in, 4-64 illus. f.
Penelope (penel'opé). In Homer's *Odyssey*, wife of Odysseus; proverbial for faithfulness, 4-418, 5-500, 503.
Penetrometer. Instrument to detect the penetrating power of X-rays.
Pengö. Former monetary unit of Hungary, replaced in 1946 by forint.
Penguin. An Antarctic sea-bird, 6-115, 117 illus. f.; in Antarctica, 1-169, 1-166 illus.; feathers, 3-344; instinct and intelligence, 1-154.
Penicillin. See Antibiotics; Fleming Sir Alexander.
Penicillium. Genus of mould fungi, including *P. glaucum*, the common blue-green saprophytic mould that grows on moist bread, etc., and *P. notatum*, from which the antibiotic penicillin is obtained, 5-284.
Penicuik. Tn. in Midlothian, Scot.; pop. 4,255, 6-40.
Peninsula, formation of, 6-187.
Peninsular and Oriental Steam Navigation Company (P. & O.). Line of steamships plying from U.K. to Egypt, India, Far East, and Australia; founded 1834.
Peninsular War (1808-14), 6-116; St. John Moore at Corunna, 5-259; Napoleon and, 5-322; Spain and, 7-105.
Penknife, origin of name, 6-111.
Penn, William (1644-1718). Eng. founder of Pennsylvania, 6-117; charter for Pennsylvania, 6-120.
Penney, Sir William George (b. 1909). Brit. physicist; worked with Americans on atomic bomb; became head of Brit. govt. armament research, 1946, and was scientific director of Brit. atomic explosions at Monte Bello Isls., Oct. 1952 and at Woomera and Ema Field, Australia, Oct. 1953.
Pennl. See Money (list).
Pennillion Singing, 7-413 illus. f.
Pennines. Range of mts. extending from Scottish border to r. Trent, Eng. 6-118, 2-58, 3-247.
Pennine Way. Footpath along the length of the Pennine Chain 6-118.
Pennsylvania. An E. marltime state of U.S.A.; area 45,333 sq. m.; pop. 10,498,012; cap. Harrisburg; 6-119; Penn and, 6-118.
Pennsylvania, University of, at Philadelphia; established in 1740 as a charitable school; made an academy in 1751 through the efforts of Benjamin Franklin, and became a college in 1755, 6-153.
Penny. An Eng. bronze coin worth one-twelfth of a shilling or 4 farthings; before the time of Edward I halfpence and farthings were not coined, but the penny was deeply indented with a cross, so that it could be broken into two or four pieces; retained as Irish Rep. coin, 4-283 illus.
Penny Black. First of all adhesive postage stamps, 7-144 illus.
Penny-farthing. Early type of bicycle, 3-15, 7-412 illus. f.
Pennyroyal. Variety of mint, 5-222.
Penrith. Tn. of Cumberland, Eng.; pop. 10,490; 3-70.
Pensacola, Florida, U.S.A. Port on Pensacola Bay; pop. 43,479; fish, lumber, and shipbuilding interests; large naval air station.
Penshurst Place. Historic mansion in Kent with park of 350 acres. Built in 14th cent. by Sir John de Pulteney; in 1552 passed to Sir William Sidney, grandfather of Sir Philip Sidney, whose family still own it; 4-398.
Pension. Grant or payment made for services rendered, 6-120; old age pensions in N.Z., 6-426.
Pentagon, The. H.q. of U.S. war dept., at Arlington, 2 m. from Washington, D.C., 7-422.
Pentamethonium. Drug that lowers blood-pressure; in operations, 1-143.

PERCY

Pentathlon (pentath'lón). "Five-in-one" contest in Olympic Games in which each competitor must ride, fence, shoot, swim, and run a cross-country race, 5-508.
Pentateuch (pen'tat'ók). First five books of the Bible.
Pentecost. See Whitsunday.
Pentelic Marble. Variety of marble used for Gk. sculpture, 5-121.
Pentelious, Mt., Greece, near Athens; 1-287.
Penthesilea (penthesil'éa). Daughter of Ares and queen of the Amazons, aided Trojans against Greeks; slain by Achilles, 1-130, 1-11 illus.
Pentland Firth. Channel separating Orkney Isls. from mainland of Scot., and connecting Atlantic Ocean with North Sea.
Pentland Hills, Scot. A range running through counties of Midlothian, Peebles, and Lanark, s.w. for 16 m.; 5-39.
Pentothal. An anaesthetic, injected in vein, 1-143.
Penumbra, of eclipse. The partial shadow between the umbra, or region of total eclipse, and the region entirely free from eclipse.
Pen y Fan, or Arthur's Chair (2,907 ft.), highest mt. in S. Wales, 2-55.
Pen-y-Ghent. Mt. in Yorks, Eng. (2,273 ft.), 6-118.
Penzance. Tn. and spt. in Cornwall; the westernmost tn. in Eng. at the head of Mount's Bay; chief industry fishing; pop. 20,648.
Peony. Flower belonging to family *Paeoniaceae*, 6-120 with illus. f.
People's International League. Revolutionary movement founded by Mazzini, 5-151.
People's Palace. Mile End, London. Owed its origin to a bequest by Harber Beaumont which was supplemented by the Drapers' Company and certain individual donors; provided facilities for education, recreation and amusement; its chief feature was the Queen's Hall. This was burnt down in 1931, rebuilt, and sold Dec. 1953 to Queen Mary College, Univ. of London.
Peoria, Illinois, U.S.A. Mfg. and city in N. centre on Illinois r.; pop. 111,856; formerly great distilling centre; agric. implements, paper, motor-vehicles.
Pepin or Pippin the Short (d. 768). First Carolingian king of the Franks, son of Charles Martel and father of Charlemagne, 4-306, 2-303, 2-309.
"Pepin's Donation." Grant of land to the Papacy, the origin of the Papal States in Italy, 4-306.
Pepper. Spice obtained from the plant *Piper nigrum*, 6-121, 7-131 illus.; vines, 6-121 illus. f.
Peppercorn, white and black pepper, 6-121.
Peppermint. Variety of mint, 5-222, 223 illus.
Pepsin. Substance present in gastric juice in alimentary canal. Aids digestion by breaking down food proteins into more easily assimilated form, 3-90.
Pepys, Samuel (1633-1703). Eng. diarist and Admiralty official, 6-121, diary, 3-287; on Quakers, 6-317.
Perak (pérák'). State of Federation of Malaya, formerly northernmost of Fed. States; area 7,900 sq. m.; pop. (including Dindings), 953,938; 5-94.
Percentage and Interest, 6-122.
Perceval, Sir. Knight of King Arthur's Round Table in Arthurian legends, 1-256, 4-54.
Perch. Fresh water fish, 6-123.
Perch, Rod or Pole. Measure of length and area. See Weights and Measures (table).
Percheron. A heavy type of working horse. See Horse (list).
Percussion Band, 5-306 illus.
Percussion-cap Gun, 3-359.
Percussion Instruments, types of, 5-307.
Percy. Famous Eng. family, 4-162.
Percy, Sir Henry (1365-1403). "Harry Hotspur," Eng. warden of Scottish marches and hero of Chevy Chase

PERCY

(1388); killed in rebellion against Henry IV, 4-162.
Percy, Thomas (1730-1811). Brit. bishop; ballad collection, *Rhiques of Ancient English Poetry* (1766), 1-351, 3-388.
Perdido, Monte. Mt. in Pyrenees, 10,997 ft., 6-313.
Peredur. Welsh legend, and quest of the Grail, 4-54.
Peregrine Falcon (*perigrina*). Bird of prey now chiefly confined in U.K. to cliffs of south-west and west, famed for its speed, strength and ferocity; in hawking, the most important of all falcons, 1-152, 154, 4-141; feeds chiefly on fair-sized birds such as ducks, pigeons, etc.
Père-Lachaise (*pâr la shâs'*). Famous cemetery in N.E. Paris; contains 20,000 monuments and 800,000 graves, including many of great figures in Fr. history; 6-84.
Perennial Plants. 6-218.
Perfoliate. Bot. term for a type of leaf in which the actual stem runs through the middle of the leaf; 4-471 with illus.
Perfume. 6-123; ambergris as fixative, 1-131; essential oils, 5-506; oil of jasmine in, 4-355; lemon oil in, 4-478; musk from musk deer, 5-309.
Pergamum (*por'gamum*) or **Pergamus.** Celebrated anc. city of N.W. Asia Minor, cap. of kingdom of Pergamus and later of Rom. prov. of Asia; fine sculptures, many of them were exhibited in Berlin's Pergamon Museum. They were removed to Leningrad by Russians after 1945.
Peri. In Persian myth., a fairy-like being between an angel and a demon; harmless and beautiful, but excluded from Paradise.
Perianth. Name for petals and sepals of a flower when taken together.
Periolella Galactini moth, 2-142 illus.
Pericardium. A cone-shaped membranous sac which encloses the heart and about two inches of the main blood vessel; attached at its base to the diaphragm; the inner surface, a serous (moist) membrane, secretes a fluid which lubricates the heart.
Pericarp. Pulp seed-envelope of fruits such as apples, 3-480.
Pericles (c. 500-429 B.C.). Athenian statesman, 3-125; and the Acropolis, 1-12; age of, 1-287; and Phidias, 6-153; policy, 4-73.
Peridot. See *Stones, Precious*.
Perilymph. Liquid in bony labyrinth of ear, 3-147.
Perim. Small Brit. isl. at S. end of Red Sea, included in colony of Aden, 1-19.
Period. The time for one complete cycle of any recurring phenomenon. The period of oscillation of a vibrating body is the time between successive passages in the same direction across the position of rest. In electrical engineering, a period is the time during which an alternating current passes once through its complete cycle of phases.
Periodic Table of Elements. 3-224, 3-225; Mendeleev and, 3-189.
Periboei. Spartan citizens living outside the city, 7-124.
Perioleum. In anatomy, membrane on surface of bone, 1-318.
Peripatetics. Followers of Aristotle, so named from his custom of walking about while lecturing (Gk. *peripatēn*, to walk about), 1-228.
Periscope. 6-126, 127 illus.; camera obscura principle, 2-189; in submarine, 7-175, 176 illus.
Perissodactyla. Order of mammals with odd number of toes, 5-103.
Peristalsis. Movement of the gut in digestion, 3-90.
Peritoneum. A moist membrane which encloses all the organs lying in the abdominal and pelvic cavities; inflammation of the peritoneum is called peritonitis.
Peritonitis. and **appendicitis**, 3-90.
Periwinkle. A sea-snail with top-shaped shell, 5-233, 7-24 illus. f.
Periwinkle. Various creeping plants of family *Apocynaceae* with opposed

evergreen leaves; the lesser periwinkle, *Viola minor*, is native to the Brit. Isles; it has violet or blue flowers which appear early in the year; great periwinkle, *V. major*, has much finer flowers and is larger in every way.
Pertiyar. R. in Madras state, India, 5-70.
Perkin, Sir William Henry (1838-1907). Brit. chemist; discoverer of the first aniline dye, aniline purple; founder of the coal-tar dye industry, 3-141.
Perle d'Or. Variety of rose, 6-453 illus. f.
Perlis. State of the Federation of Malaya; area 310 sq. m.; pop. 70,490; rubber, rice, coconuts and tin produced; 6-94.
Permanent Court of International Justice. The Hague, Netherlands, estab. 1922 by League of Nations, 4-459; ceased to exist when League was dissolved, 1946. Its place was taken by the International Court of Justice, created under U.N. Charter, 1945.
Permanganate (*perman'ganāt*). Salt of permanganic acid, deep violet in colour; potassium permanganate and sodium permanganate used as disinfectants.
Permian Period. In geology, 3-515, 516.
Permittivity (electricity), 3-215.
Pernambuco (tn. Brazil). See *Recife*.
Perón, Juan Domingo (b. 1895). President of Argentina 1916-55. Fell as result of a military coup and went into exile. His wife Dona (Marin) Eva (d. 1952) played an important part in politics; 1-226.
Péronne (*pâron'*). Fr. fortified tn. on Somme; Charles the Simple and Louis XI imprisoned here; unsuccessfully besieged by Imperialists (1536); scene of desperate battles in 1st World War.
Perpendicular. English architectural style (1377-1485), 1-211.
Perpetual Calendar. A system of reckoning time by means of a calendar which enables one to find the day of the week for any date in any year; dominical letters are used for the purpose of showing on what day of the year the first Sunday comes.
Perpignan (*pârpnyahn*). Fr. city, cap. of Pyrénées Orientales, dept. in S. on R. Têt, 7 m. from Mediterranean; pop. 75,000; 14th-cent. cath.; splendid fortifications, incl. citadel by Vauban.
Perrault (*perô*), **Charles** (1628-1703). Fr. author who gave literary form to many old fairy tales, 2-354, 1-494.
Perry, Frederick J. (b. 1909). Brit. (nat. Amer.) lawn tennis player. One of the world's leading players, winning the singles at Wimbledon in the years 1934-36 afterwards turned professional; 4-462.
Perry, Matthew Calbraith (1794-1858). Amer. commodore; expedition to Japan, and Jap. trade with west, 4-340, 1-272.
Perry (drink). See *Cider and Perry*.
Persae, The. Drama by Aeschylus, 1-65.
Persephone (*pârsē'ôn*) or **Proserpina.** In Gk. myth., wife of Pluto, god of the underworld, and daughter of Demeter, 3-69, 6-228.
Persepolis (*pârsē'pôlis*). Anc. cap. of Persian Empire, in S.W., 35 m. N.E. of modern city of Shiraz; destroyed by Alexander, 331 B.C., 6-132, 1-99; sculpture, 6-129 illus.
Perseus. In Gk. myth., hero who slew Medusa, 6-128.
Perseus. Constellation, 2-490 diag.
Persia. Kingdom in W. Asia; area 628,000 sq. m.; pop. est. 19,139,000; cap. Teheran, 6-129; map, 6-132; flag, 3-385 illus. f.; physical features, 6-132; carpets, 2-246; costume, 2-420; marriage, 5-134; New Year's Day customs, 5-409; modern Persia, 6-132; minerals and oil, 6-134; ancient history, 6-129; under rule of Medes, 5-160; Alexander's conquest, 1-98, 99; and Armenia, 1-242.
Persian Cat. 2-263, 363 illus.
Persian Glass. 4-31 illus.
Persian Gulf. Arm of Indian Ocean separating Persia from Arabia, 6-184.
Persimmon. A tree of the ebony family; a native of N. Amer., it yields a hard wood used for shoe lasts and handles; the Japanese persimmon is an important fruit tree.
Persson, in grammar. 7-390.
Personality. and the brain, 2-41; classified for careers, 2-223; glands and, 4-73.
Personification. Figure of speech, 3-351.
Perspective and drawing. 6-125, 3-123.
"Perspex." Transparent plastic material, 6-219 illus.; used for lenses, 4-482.
Perth, Scot. Co. tn. of Perthshire on Tay; pop. 40,466; rope and twine, textiles, dyes; cattle market; scene of murder of James I of Scotland (1437); 6-138.
Perth. Cap. of Western Australia; pop., including neighbouring port of Fremantle, 309,000; 6-137.
Perthshire. Co. of Scot., area 2,493 sq. m.; pop. 128,072; co. tn. Perth, 6-138.
Perthus Pass. in Pyrenees, 6-314.
Peru. Republic of S. Amer.; area about 524,000 sq. m.; pop. est. 8,492,873; cap. Lima; 6-138; flag, 3-385 illus. f., conquest by Pizarro, 6-210; boundary dispute with Chile, 2-360.
Perugia (*perôj'jah*). It. Historic city on r. Tiber, 81 m. N. of Rome, pop. 82,400; cath and other interesting buildings; Etruscan gateways, frescoes by Perugino, old univ. (13th cent.); anc. Perugina was one of 12 principal cities of Etruria; taken by Romans 310 B.C.; centre of Umbrian school of painting (15th cent.), 4-318.
Perugino (*pâroj'ôdô*). "Easel name of painter Pietro Vannucci (1464-1523), of Perugia, created classic type of Madonna and moulded early style of Raphael, 6-363, 4-318.
Peruvian Balsam. 6-492; in perfume, 6-124.
Pesaro (*pâ'zahrô*). It. apt. on Adriatic pop. 44,000; several palaces; silk ships, ironware, earthenware founded by Romans 184 B.C.
Pescadore (*pâskâdôrôz*). ("fishers' isles"). An Isl. group (50 sq. m.) between China and Formosa, Jap. ceded to China 1945, 3-421. Also Isl. group off coast of Peru 4-310.
Peseta (*pâsâ'tah*). A silver coin, the unit of the Sp. monetary system, consists of 100 centesimos.
Peshawar (*pâshah'war*). Cap. of N.W. Frontier Prov., Pakistan, on r. Rgra, 19 m. E. of Khyber Pass, pop. 114,000; centre of trade with Afghanistan and Central Asia, military and air base; manufactures scarfs; rly. 1-46, 6-14, great mosque, 6-39 illus.
Peso. See *Money* (list).
Pest. Became cap. of Hungary (1867) merged with Buda to form Budapest in 1873, 4-207.
Pestalozzi (*pâstâlôz'sô*), **Johann Heinrich** (1746-1827). Swiss educational reformer, 3-166. The famous children's village named in his honour was founded 1946 at Trogen near St. Gall, Switz., to bring up and train some 200 war orphans of many nationalities, in their own language but in an international community. It included British houses.
Pests. in Africa, 1-48; aphids, 1-182; card in Australia, 2-157; catnip, 2-263; grey squirrel, 7-110; ladybirds, 4-436; locust, 5-14; mildews, 5-284; potato blight, 6-273; rats, 6-366; sawflies, 6-501; spraying fruit pests, 3-480, 479 illus.
Pétain, Henri Philippe (1856-1951). Marshal of France, 3-144, 7-484.
Petals. of flowers, 3-999; as modified leaves, 4-472; of lily, 3-406 illus.
Petén. Plain in Guatemala, Cen. Amer.; products, 4-101.
Peter, St. One of the twelve apostles 6-145, 1-184; as first bishop

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Rome, 6-436; and **Papacy, 6-60**; "thumbprint," on haddock, 4-115.
Peter I, the Great (1672-1725). Tsar of Russia, 6-145, 6-474; foundation of St. Petersburg, 4-479; introduction of ballet, 1-351; tax on beards, 1-397.
Peter (b. 1923). King of Yugoslavia. In 1947 deprived of his nationality and his property confiscated; 7-320.
Peter (of Colechurch). Monk who began the building of Old London bridge, 2-60.
Peter, Epistles of. Two books of New Testament ascribed to Apostle Peter, addressed to scattered Christians urging them to conduct themselves in an exemplary manner and avoid false teachings; 6-145.
Peterborough. Cath. city in Northants, Eng.; pop. 53,419, 6-146; industries and cathedral, 5-456 with illus.
Peterborough, Soke of. Admin. dist. of Northants, Eng.; area 834 sq. m.; pop. 63,784; 6-146.
Peterhead. Tn. in Aberdeenshire, Scot.; 1-5.
Peterhouse, Cambridge Univ. 2-181.
Peter Lombard (c. 1100-60). It. theologian and teacher; bishop of Paris 1159 (*Four Books of Sentences*, famous theological text-book).
Peterloo Massacre. Name given to dispersal by military of a meeting at St. Peter's Field, Manchester, in 1819, when several lives were lost, 7-349.
Peter Pan. Story by J. M. Barrie, 1-373; statue in Kensington Gardens, 1-372 illus.
Peter's Pence. A tax levied in England by the pope in 8th or 9th century. Abolished by Henry VIII in 1534 during quarrel with Papacy.
Peter the Hermit (d. 1115). Fr. monk, preacher of First Crusade, 3-1.
Petiole. In botany, name given to stalk of a leaf, 4-470.
Petipa, Marius (1822-1910). Fr. dancing-master; and Russian ballet, 1-352.
Petit-grain Oil. Distilled from leaves of bitter orange trees, used in perfumes, 6-70.
Petition of Right (1628), 3-278. 6-88, 7-170.
Petit-point, type of embroidery, 3-238.
Petit Truss. In bridge-building, 2-64, 63 diag.
Petra (pet'ra). Anc. city in mts. of N.W. Arabia; once important caravan centre; cap. of Nabataeans; absorbed into Rom. empire A.D. 106; remarkable remains, especially cliff temples and dwellings; 4-383.
Petrarch (pet'rarch) (Francesco Petrarca) (1304-74). It. lyric poet, scholar and patriot, second to Dante alone in It. poetry, 4-329, 6-384.
Petrels. Sea-birds, 6-146; species in Antarctica, 1-169; albatross related, 1-92.
Petrie, Sir (William Matthew) Flinders (1853-1942). British Egyptologist; author of many works on Egyptian history and antiquities.
Petrified Forest, Arizona, U.S.A. A tract of 133 sq. m. strewn with petrified logs of an anc. forest, turned to jasper, onyx and chalcedony, when the land was submerged in prehistoric times, 1-238.
Petro de Verona (1200-52) Dominican monk and inquisitor-general, later canonised as St. Peter Martyr; first to burn heretics, 4-283.
Petrograd. Former name of Leningrad from 1915 to 1924, 4-479.
Petrol. Volatile liquid distilled from petroleum, 6-150, 151; as fuel in internal-combustion engines, 4-275; and natural gas, 5-331.
Petroleum. A mineral oil, 6-147; in Alberta, 1-93; at Bahrain, 6-136; as a fuel, 1-505, 3-487; and geology, 3-517; production in Indonesia, 4-257; in Iraq, 4-280; in Persia, 6-134; in Rumania, 6-469; Russian production, 6-473.
Petrol gauge, in motor vehicle, 5-282.
Petronius Arbiter (d. A.D. 66). Rom. writer; wrote *Satyricon*, of which

fragments have been preserved, revealing keen sense of humour and sound knowledge of human nature, 4-451.
Petrovich, Kara George (1762-1817). Peasant leader who became chief of the Serbs; and Serbian history, 6-532.
Petrus Peregrinus (c. A.D. 1256), early experiments in magnetism, 5-81.
Petsamo. Ice-free spt. of Murmansk region, R.S.F.S.R., on Arctic; ceded by Russ. to Finland in 1920; changed hands several times in Russo-Finn. war; ceded to Russ. Sept. 1944.
Pets' Corner, at London Zoo, 7-525, 528 illus.
Petrie, John (1830-93). Brit. artist; became R.A. in 1873.
Petty Jury, in law, 4-387; Henry II and, 4-182.
Petty Officer. In the Royal Navy ranks below an officer just as a n.o.o. does in the army, 5-357.
Petty Sessions, Court of, 2-620.
Petunia. A perennial plant introduced into Brit. from S. Amer. in the 19th cent.; plants 6 in. to 3 ft. high, funnel-shaped flowers, usually shade of blue, red, or purple.
Pevensay. Village in Sussex, Eng.; here William the Conqueror landed, 1066, 7-451.
Pewsey, Vale of, Wilts, Eng., 3-111.
Pewter, an alloy, originally of tin and lead; now sometimes of tin, copper, and antimony; 1-178.
Pfennig. See *Money* (list).
Phaeacians (fæ'shənz). In Gk. myth., people who inhabited Isl. of Scheria (probably Corfu).
Phaedrus, Roman fabulist; 1-46.
Phaestus. Anc. Cretan city; archaeological excavations, 1-25.
Phaeton. In Gk. myth, son of Helios, the sun god, tried to drive his father's chariot across the skies, but could not control the horses, so that he came too near the earth and scorched it. Zeus killed the rash youth with a thunderbolt. Also name given to a high four-wheeled open carriage for one or two horses, introduced in late 18th cent.
Phagocytes. See *Leucocytes*.
Phalanx. Various five-toed marsupials, 6-137.
Phalanges, fourteen bones in fingers of hand, 4-125.
Phalanx. In anc. Gk. armies, 1-246; of Sparta, 7-267, 268 illus.
Phalarope (fal'aröp). A small wading bird; grey phalarope is common winter visitor to Brit.; red-necked breeds in far N. of Brit.; 1-470.
Phanerogama. Bot. name for flowering seed-producing plants, 6-529.
Pharaohs. Kings of anc. Egypt; foundation of royal line, 3-184.
Pharisees (fai'rizz). Most powerful and exclusive Jewish sect at time of Christ; especially exact in observance of traditions and ceremonies; and Christ, 4-364.
Pharmacy, cargo in, 2-238.

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Pharos. Lighthouse which once stood on Isl. of Pharos, off Alexandria, Egypt; one of the seven wonders of the world, 7-2, 3 illus., 1-101, 102, 4-502.
Pharpar (fahr'pah). One of the two "rivers of Damascus." See *Abana*.
Pharmacopoeia, British (fab'rakōpō'ē). An official publication issued by the General Medical Council containing the list of drugs of the Materia Medica, with directions for the preparation of medicines.
Pharsalus (fahrs'ulz) (now Pharsala). Gk. city of S. Thessaly; battle fought between Caesar and Pompey (48 B.C.), 5-129, 2-162.
Pharynx (far'inks). Lined passage running from nostril above and behind the mouth to the oesophagus.
Phase-contrast Microscopy, 6-106.
Phaeogoneus viridissima. Great green grasshopper, 4-65.
Phasian. A game bird (*Phasianus colchicus*), 6-153 with illus. f.
Pheldias (c. 400-432 B.C.). Gk. sculptor 6-153, 4-89.
Parthenon sculpture, 3-228, 1-12; statue of Zeus, 7-1, 5-510, 7-523.
Phenacetin. Colourless crystalline substance, a coal-tar derivative. Used medicinally to relieve pain and reduce fever.
Phenobarbitone. A barbiturate drug; as poison, 6-236; as sedative, 6-299.
Phenol. Chemical and industrial name for Carboic Acid (q.v.).
Phenolphthalein (fēn'olthāl'ēin). A laxative drug obtained from coal-tar.
Phi (fī), φ (Rom. ph, Ph). Twenty-first letter of Gk. alphabet.
Phi Beta Kappa (fī bē'tā kap'ā). The name of the oldest college fraternity in the U.S.A.; the first group was founded at William and Mary College, Virginia, in 1776; name derived from three Gk. letters, initials of *Philosophia Bios Kybernetes* (philosophy the guide of life).
Phidias (Gk. sculptor). See *Phedias*.
Philadelphia. City and spt. in Pennsylvania, U.S.A.; pop. 2,071,605; 6-153, 6-118; Continental Congress (1774), 1-137; suspension bridges, 2-67.
Philae (fī'lā). Temple of. On Isl. of Philae in r. Nile; erected to goddess Isis, 4th cent. B.C., 3-200.
Philately. See *Stamps and Stamp-Collecting*.
Philby, H. St. John (b. 1885). Brit. explorer in Arabia, 1-196.
Philemon, Epistle to. Book of New Testament; written by Paul during first captivity at Rome explaining the return of a runaway slave converted to Christianity.
Philetas of Cos. A dwarf. Gk. poet and tutor to Eg. king, 3-140.
Philip, St., Apostolic. Feast day, May 1, 1-184.
Philip I (1052-1108). King of Fr.; seized advantage of quarrels among his powerful vassals to enlarge crown holdings.
Philip II (Philip Augustus, reigned 1179-1223). King of Fr., 6-155, 3-449; on Third Crusade, 3-2; quarrel with Richard I, 6-398.
Philip IV (reigned 1285-1314). King of Fr., 6-155, 3-450; and Boniface VIII, 1-519; and Knights Templars, 4-418; first summoning of States-General (1302), 3-467.
Philip VI (reigned 1328-50). King of Fr., 6-155.
Philip II (382-336 B.C.). King of Macedonia, father of Alexander the Great, and conqueror of Greece, 7-267, 4-77, 1-98; and Bucephalus, 2-102.
Philip I (1478-1506). Kings of Spain; son of Maximilian I and Mary of Burgundy; right to Castile and Aragon through wife Joanna disputed by his father-in-law Ferdinand; and father of Charles V.
Philip II (reigned 1556-98). King of Spain, 6-155; and William, Prince of Orange, 7-454; Armada, 1-240; and Inquisition in Spain, 7-105; and Mary Tudor, 5-140; seized throne of Portugal, 6-269.

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lb	pound
℥	ounce
ʒi or ʒj	one ounce
ʒij	two ounces
ʒiiss or ʒjss	one ounce and a half
℥	fluid ounce
ʒ	drachm
ʒi or ʒj	one drachm
ʒi	one scruple
℥	pint
m	minim
R	recipe

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Philip III (1578-1621). King of Spain, succeeding on the death of Philip II, his father, in 1598; a pious but weak ruler, Sp. continued to decline during his reign.

Philip IV (1605-65). King of Spain, incapable administrator; reign marked by rapid decline of Sp. power; portrait, 4-129.

Philip V (reigned 1700-46). King of Spain, 6-155; founder of Bourbon dynasty, 2-28.

Philip, Duke of Edinburgh (b. 1921). Husband of Elizabeth II of Gt. Brit., 6-154; Canadian tour, 2-195; title, 6-463; at polo, 6-254 illus.; as a yachtsman, 7-511, 510 illus.

Philip, King. The Indian chief Metacombet (c. 1639-76), sachem of Wampanoags in Mass., U.S.A.; son of Massasoit; leader of "King Philip's War" (1676) against New England colonists.

Philip the Bold (1342-1404). Duke of Burgundy (1363), son of John II of France. Through his wife's inheritance became joint ruler with her of Flanders and Franco-Comté. In 1392 became regent for Charles VI of France.

Philip "the Good" (1396-1467). Duke of Burgundy; signed treaty of Troyes for Fr.; later aided Eng. against Fr., gaining considerable territory; patron of commerce and industry; founded Order of Golden Fleece, 2-98.

Philip of Swabia (c. 1177-1208). Youngest son of Frederick Barbarossa, Duke of Swabia; succeeded brother Henry VI as emperor (1198); murdered while disputing claims of his rival Otto IV.

Philip Augustus. See Philip II of Fr.

Philippa (1314-69). Queen of Edward III of Eng.; and Froissart, 3-177; and hughers of Calais, 4-201 illus.

Philippe Egalité. See Orléans, Louis Philippe, Duke of.

Philippi. City in anc. Macedonia, founded by Philip II. Important as scene of battle, 42 B.C., between Rom. forces of Octavian and Antony, and those of Brutus and Cassius, 4-309.

Philippians, Epistle to. Book of the New Testament; letter from Paul to Christians at Philippi reassuring them of his prospects of release and appealing for unity in their church; probably written at Rome A.D. 63.

Philippus. Series of speeches by Demosthenes, so named as they warned Greeks against Philip of Macedonia's plan to overthrow Gk. independence, 4-77. Hence "philippic" is often used for a violently abusive speech.

Philippine Islands. Archipelago between China Sea and Pacific Ocean, since 1946 an independent republic; area 115,600 sq. m.; pop. 19,231,182, 6-456; flag, 3-385 illus. f.; discovered by Magellan, 5-77; given to Spain by Portugal (1529), 1-133; in 2nd World War, 7-491, 498.

Philippopolis (Bulgaria). See Plovdiv.

Philippines, Edward (1630-96). Eng. writer, nephew of Milton; dictionary, 3-88.

Philistine. Name given to uncultured person with no interest in the arts, 6-158.

Philistines. Tribe of anc. Canaan, 6-157, 6-45; and Israelites, 4-374; and Samson, 6-495.

Philp, Arthur (1738-1814). British sailor who became first governor of Botany Bay, and helped in the colonisation of Australia; he arrived in Botany Bay in 1788; foundation of Sydney, 1-317.

Phillips, Horatio (1845-1920). Brit. aeronautical engineer; model aeroplane, 1-37.

Phillips, Stephen (1868-1915). Brit. writer of poetic drama (*Marjessie*; *Paulo and Francesca*; *Ulysses*).

"Phillips's Entry." Name given to leading edge of aeroplane wings designed by Horatio Phillips, 1-37.

Philumenists. Collectors of match-box labels, 5-147.

Philology. The science of language, 6-158. See also Language, and names of individual languages.

Philomel (fil'omel) or Philomela. Poetic name for nightingale. Philomela, in Gk. myth., was sister of Procne, wife of Tereus, king of Thrace; in revenge for their wrongs they killed Itys, Tereus' son, and served him as food to his father; the gods punished them by turning Procne into a swallow and Philomela into a nightingale.

Philosopher's Stone. In alchemy, 1-95.

Philosophy. 6-158; Gk. philosophers and the Pates, 3-342, 343; Aristotle, 1-228; Leonardo da Vinci, 4-484; Plato, 6-222; Socrates, 7-82.

Phintias (Pythias). See Damon and Pythias.

Phitsanulok. Town in Siam, 7-45.

Phlogiston. Supposed substance of which fire was thought to be the visible form, in old theory of chemistry, 2-317; theory destroyed by Lavoisier, 4-157.

Phlox. Flowering plant, 6-160, 161 illus.; pollen grains, 3-399 illus.

Phobia. In psychology, 3-212.

Phocis (fō'sis). Anc. dist. in cent. Greece; chief mt., Parnassus; took part in Sacred War (357-316 B.C.) and was conquered by Philip of Macedon.

Phoebe. Classical name for the moon, 6-259.

Phoebus. In Gk. myth., name for Apollo as sun god.

Phoenician Glass. 4-31 illus.

Phoenicians. Semite people inhabiting narrow strip along Mediterranean coast of anc. Syria, 6-160; alphabet, 1-120 with illus.; invention of blowpipe, 4-30; foundation of Carthage, 1-52, 2-255; marine insurance, 4-271; as navigators, 5-341; trade with Britain, 3-275; ships, 7-28; voyages and discoveries, 3-514, 5-166.

Phoenix (fē'nix). Arizona, U.S.A. Cap. and popular winter and health resort in S. centre; pop. 105,142; trade centre of rich farming dist. created by Roosevelt dam; 1-239.

Phoenix. In Gk. myth., son of Amyntor, tutor of Achilles, 1-10.

Phoenix. Fabulous sacred bird of anc. Egyptians, said to come out of Arabia every 500 years to Heliopolis, where it burned itself on altar and rose again from its ashes young and beautiful; regarded as symbol of rising sun and immortality.

Phoenix Park Murders. Dublin (1882); Parnell and, 6-91.

Phon. Unit of loudness, used to measure the intensity of sounds. The loudness, in phons, of any sound is equal to the intensity in decibels (q.r.) of a sound frequency of 1,000.

Phonograph. Old type of gramophone, 4-56 illus.; Edison's invention, 3-164.

Phonopticon. Device for converting light impulses into sound to enable the blind to read through hearing.

Phorcys (fōr'sis). In Gk. myth., a sea-god, father of the Gorgons, the Graeae, and other monsters.

Phosphate (fōs'fāt). A salt of one of the phosphoric acids, used as fertiliser; essential to cattle pasture, 6-162.

Phosphor Bronze. 2-92.

Phosphorescence and Fluorescence. 6-161, 162.

Phosphoric Acids. Compounds of hydrogen, oxygen, and phosphorus.

Phosphorus (P). Chemical element of the nitrogen group; atomic no. 15; atomic weight 30.98; 6-162, 3-221; extraction from iron, 4-291.

"Phossy Jaw." Disease of jawbone which attacked persons engaged in manufacture of phosphorus matches. See Necrosis.

Phot. Unit of illumination; one phot—1,000 millilumens—10,000 lux.

Photo-chemistry. 6-162.

Photo-conducting Cells. 6-163.

Photo-electric Cell. Electronic device the electrical properties of which

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undergo a change when it is exposed to light. For general description see 6-163 illus.; and television, 7-254; for counting passing objects, 6-164 illus.; safety device in lifts, 4-496; selenium in, 6-530; in industry, 4-502.

Photo-electric Devices. 6-162.

Photographic Exposure Meter, photo-voltaic cell, 6-164.

Photographic Memory, advantage of, 5-168.

Photography. 6-169; and aerial map-making, 5-120 illus. f.; air photography and archaeology, 1-206; aspects of camera craft, 6-173 180 illus.; as aid to astronomy, 5-494, 7-145, 1-284; camera obscura, 2-189; careers in, 2-238; colour photography, 6-165-168 illus.; distortion by camera, 6-136; as aid to geology, 5-215; photographs reproduced by half-tone process, 6-292; high-speed, 6-172 illus.; influence on impressionist painters, 4-237; infra-red photography, 4-261, 260 illus.; magnesium powder, 5-81; newspaper libraries on film, 4-488; as aid to oceanography, 5-498; optics, 5-522; photo-chemistry, 6-162; photomicrography, 5-197 illus.; use of polarising filters, 4-501; press photography, 2-231 illus.; transmission by radio, 5-101; silver used in, 7-56.

Photogravure, process, 6-293.

Photo-lithography. 6-291.

Photometer. Instrument for comparing and measuring the luminous intensities of light. Common type consists of a white screen with a grease spot at its centre. The sources of light are mounted at the opposite ends of the screen, and the positions of the light sources are adjusted until the grease spot is no longer distinguishable; the ratio of the candle (q.r.) power of the lights will then be the ratio of the squares of the respective distances from the screen. Modern photometers use photo electric cell.

Photomicrograph. Photograph (taken through a microscope, 6-169, 5-197 illus., 6-179 illus.; of diatoms, 6-216 illus. f.; of granite, 5-214 illus.

Photon. Unit of radiation energy; a light particle, 4-502, 6-318.

Photosphere. The visible surface of the sun on which sunspots and other markings appear, 7-190.

Photosynthesis. 6-182; effects on air, 1-81; and chlorophyll, 1-117, 1-151, in leaves, 4-169.

Photo-voltaic Cell. 6-161.

Phrase (music). See Musical Terms (Mus.).

Phrase. In a sentence, 6-531.

Phrenology. Pseudo-science purporting to discover talents and mental characteristics from a study of the shape and irregularities of the skull.

Phrygia (frī'jā). Anc. country of w. Asia Minor; extent varied at different periods; overrun by Cimmerians 7th cent. B.C.; later ruled by Lydia, Persia, Macedonia and Rome; music and orgiastic rites influenced Greeks.

Phthisis. See Tuberculosis.

Phya Yomara. Siam's king of the devils or god of death, 7-41 illus. f.

Phycomycetes (fīkōmī'sēz). A class of fungi, includes some of the lower mildews and moulds.

Phyllis Gold. A rose, 6-152 illus. f.

Phylloxera. Genus of insects of order Hemiptera, closely allied to aphids. One species is a grape pest which caused great damage in vineyard of France.

Phylogeny (fīlōj'ent). Ancestral history of a species or people.

Phylum. A major division in biological classification, the first subdivision of a kingdom and itself divided into classes; 2-21, 1-452.

Physalia. See Portuguese Man-of-War.

Physical Education. 6-183; of the blind, 1-487 illus.; and eurythmics, 3-307.

Physical Units. Selected physical quantities in terms of which the

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magnitudes of other physical quantities, of a like kind, may be reckoned or expressed. The chief systems of units are centimetre-gram-second; metre-kilogram-second; foot-pound-second (*q.v.*).

Physicians, Royal College of. Corporation founded by Henry VIII. in 1518, under presidency of Linacre. Has fine building and library in London.

Physics. 6-185; atom, 1-296; atomic energy, 1-299; careers in, 2-238; centrifugal force, 2-293; development of, 6-186; electricity, 3-210; electrolysis, 3-220; electromagnetic waves, 3-221; electron, 3-221; electronic devices, 3-221; energy, 3-215; ether, 3-301; friction, 3-370; gases, 3-508; gravitation, 4-45; heat, 4-145; hydraulics, 4-214; hydro-meter, 4-223; light, 4-498; lighting, 4-504; liquids, 4-520; magnetism, 5-81; mechanics, 5-156; Newton's laws of motion, 5-159; Quantum theory, 6-317; relativity, 6-390; relativity and the ether, 3-301; sound, 7-86; spectrum and spectroscopy, 7-127; vacuum, 7-373; wave motion, 7-432; x-rays, 7-507. For practical applications of physics see **Radio**; **Telegraphy**; **Telephone**; **Telescope**; **Television**.

Physiocrats. School of 18th cent. French economists, 3-160.

Physiography. Science dealing with the form of the earth's surface, 6-186.

Physiology. 6-189, 1-151, 5-165, 7-527; blood and circulation, 1-489; bones, 1-518; brain, 2-40; cells, 2-286; comparative, 3-323; digestion, 3-89; ear, 3-117, 118; eye, 3-331; foot, 3-412; gland, 4-27; hair, 4-117; hand, 4-125; heart, 4-143; hygiene, 4-223; kidneys, 4-403; liver, 4-524; lungs, 5-51; muscles, 5-298; nerves, 5-368; of plants, 2-25; pulse, 6-301; skeleton, 7-60; skin, 7-63; sleep, 7-67; smell, 7-71; stomach, 7-161; taste, 7-229; teeth, 7-236; tongue, 7-290; touch, 7-301; voice, 7-401. See also **Food**; **Germs in Disease**; **Medicine**; **Surgery**.

Physiotherapy. 6-192; as a career, 6-193.

Phytoplankton. See **Diatoms**.

Pi [pī], π, Π (Rom. p. Π). 16th letter of Gk. alphabet; used as symbol representing the ratio of the circumference of any circle to its diameter 3.14159, approx. 22/7.

Piacenza. Tn. in It. on r. Po; contains 12th cent. cath. and many medieval buildings; iron, brass, pottery, silk and cotton mfrs.; printing and flour milling; pop. 75,773; 6-232.

Piacenza, Duchy of. See **Parma and Piacenza**.

Piano. Musical instrument, 6-194, 5-307; ivory keys, 4-332; Chopin's music for, 2-378.

Piano. See **Musical Terms** (list).

"Pianola" or Player-piano. Apparatus by means of which a piano can be played automatically with rolls of paper perforated according to notation, 6-196.

Piastraccia. Variety of marble, 5-121 illus. f.

Piastre. See **Money** (list).

Piave [pēāv'vā]. R. of N.E. It.; rises in Carnic Alps and enters Adriatic 20 m. N.E. of Venice; length 130 m.; battle-line in 1st World War, 7-481.

Piazzi [piā'tsi], **Giuseppe** (1746-1826). It. astronomer; discovered Ceres, largest of the asteroids (diam. 485 m.) on Jan. 1, 1801.

Pibroch. Type of bagpipe music, 1-347.

Picadors. In bull-fighting, 2-122.

Picardy [pik'ardi]. Old prov. of N. Fr.; contained towns of Amiens (cap.) and Boulogne, and battlefields of Agincourt, Crécy, St. Quentin; and in 1st World War.

Picaresque Novel. 5-471.

Picasso, Pablo (b. 1881). Span. painter, 7-121, 3-449; 3-124 illus.

Piccadilly. London street, 5-26; Manchester street, 5-111 illus.

Piccadilly Circus. London, 5-26, 5-29 illus.; underground station, 7-346 with diag.

Piccard [pē'kahrl, **Auguste** (b. 1884). Swiss scientist; investigated action of cosmic rays by balloon ascents into the stratosphere (1931 and 1932), 1-355; in 1945 investigated disintegration of sunlight at ocean depths. In Sept. 1953 dived to record depth of 10,335 ft. in a bathyscaphe off w. coast of Italy.

Piccolo. A small flute, 7-473.

Pic de Néthou. Mt. in Pyrenees, 11,168 ft., 6-313.

Pic des Possets. Mt. in Pyrenees, 11,047 ft., 6-313.

Picea [pī'sēa]. The spruce genus of trees.

Pichincha [pēchēn'cha]. Volcano on w. slope of Andes near Quito, Ecuador (highest peak 15,918 ft.); battle between patriots and Spaniards which freed Ecuador was fought on its slopes May 24, 1822.

Pickford, Mary (b. 1893). Amer. actress of great charm and talent in early silent films; known as "the world's sweetheart"; in 1919 formed 'United Artists' Corporation. (Real name Gladys Smith.)

Pickthall, Marjorie L. C. (1883-1922). Canadian poet, 2-263.

Pick-up head. In an electrical gramophone, 4-58, 59 illus.

Pickwick, Papers, The. Novel by Charles Dickens, 3-86.

Pico. Isl. of the Azores, 1-330.

Pico. Prefix signifying 10¹² (one million-millionth), part, *e.g.*, pico-farad—a million-millionth of a farad.

Pico de Teyde. El. Mt. of Tenerife, Canary Is.; ht. 12,185 ft., 2-209, 208 illus.

Pico Ruivo. Highest peak in Madeira, 6,057 ft., 6-66.

Pictographs (writing in pictures), in Chinese script, 2-365 with illus.

Picts. Early inhabitants of Scotland; in Orkneys, 6-4; invasions into Brit., 2-75; Hadrian's Wall and, 3-275.

Picture. A rose, 6-452 illus. f.

Pictures, restoration of. 2-322.

Picture Writing. See **Ideographic Writing**.

Piddock. Bivalve mollusc which bores in soft rocks.

Pie. Copper coin of sub-cont. of India.

Pied Flycatcher. Bird; migration, 5-204 illus. f.

Piedmont. Region of Italy; area 9,813 sq. m.; pop. 3,423,000; comprises provs. of Alessandria, Asti, Cuneo, Novara, Turin, Vercegli. Chief city Turin. See also **Sardinia**; **Savoy and Piedmont**.

Pied Piper of Hamelin. Magician in Ger. legend who, by his piping, charmed the rats of Hamelin to follow him into the r. Weser; because he was not paid he lured the children of the city away; story used by Browning in poem of same name; derived from *Gdln*, 5-500.

Pienaar, A. A. S. African writer, 7-94.

Pier. See **Architectural Terms**.

Pierce, Franklin (1804-69). 14th pres. of U.S.A., from 1853 to 1857; regarded as one most incompetent to hold presidency.

Pierian [pēr'ian] **Spring.** In Gk. myth., fountain of the Muses in Pieria, a region of Macedonia; supposed to have given poetic inspiration.

Piero I (1410-69). Ruler of Florence, 3-393.

Pierre. Cap. of S. Dakota, U.S.A.; pop. 5,715; 3-28.

Pierrot [pēr'rō]. Idealised clown in Fr. pantomime, derived from *commedia dell'arte*; 4-133.

Piers, Artificial. used to dredge harbours, 4-131.

Piers the Plowman (c. 1362). Poem by William Langland, 3-284.

Pietermaritzburg. Cap. of Natal; prov., S. Africa; pop. 28,000 Europeans; 5-235.

Piezoelectricity. 6-196.

Pig. 6-196; bacon and ham, 1-341; breeding for meat, 5-154; hair, 5-100; immune to rattlesnake bite, 6-366.

PIMPERNEL

Pigeons and Doves. 6-197; feeding young, 1-469; homing instinct, 4-189.

Pig-iron. blast furnace production, 1-483; origin of name, 4-293.

Pigments. Coloured substances used in preparation of decorative and protective coatings; used in paints, 6-38; why colour appears to the eye, 2-463.

Pig-skin. Type of leather, 4-169 illus.

Pig-sticking. Hunting of wild boar in India, 1-190.

Pigtail. Platted queue of hair formerly worn in China, 2-373.

Pig-tail Monkey. 5-240 illus. f.

Pike. Fish, 6-200, 3-384.

Pike's Peak. Famous peak of Rocky Mts. near Colorado Springs, Colo., U.S.A., 14,108 ft.; discovered 1806 by Zebulon Pike, 2-461.

Plaster. See **Architectural Terms**.

Plato, Pontius (first cent. A.D.). Rom. governor of Judaea A.D. 26-36, who handed Jesus over to His accusers to be crucified, 4-367, 6-15.

Pilâtre de Rozier, Jean François (1756-85). Fr. balloonist; first man to ascend in a balloon, 1-353.

Pilatus. Mt. (6,995 ft.) overlooking Lake Lucerne, Switz., 5-18; rly., 6-358 illus.

Pilchard, an edible fish which resembles a small herring, found chiefly off the coasts of Devon and Cornwall, 4-172.

Pilcomayo [pēlkōmah'yō]. R. of Bolivia and Paraguay; flows 1,000 m. from the Andes to Paraguay r.

Pile, of carpet; how produced, 2-248.

Pile Driver, use of force of gravity, 4-64 illus. f.

Pilgrimage of Grace, insurrection in N. England, on behalf of the monks (1536).

Pilgrim Fathers. 6-200; foundation of Massachusetts, 5-144; Puritans, 6-312.

Pilgrims. 6-202; shrines in Asia, 1-270; at Benares, India, 1-127; Canterbury, 2-311, 1-401; at Mecca and Medina, 5-156, 155 illus., 1-191; at Nazareth, 5-359; and scallop shells, 6-502.

Pilgrim's Progress. The. Allegory by John Bunyan, 2-125, 3-287; story retold, 2-126.

Pilgrim's Way. Anc. track, stretching from Winchester to Canterbury, mainly along North Downs, and passing through N. Kent. Pilgrims to the shrine of St. Thomas Becket at Canterbury followed this road, 6-202, 4-399, 398 illus.

Pilgrim Trust. Fund estab. in 1930 by Amer. millionaire Edward Stephen Harkness (1874-1940) for the cultural benefit of the U.K.

Pillar and Bord, method of mining, 2-432 with diag.

Pillars of Hercules. In anc. geography, the two promontories, Gibraltar in Europe and Abyla in Africa, at E. extremity of Strait of Gibraltar, 5-166, 4-20.

Pillory, instrument of punishment, 6-291.

Pillow Lace. 4-429, 431 illus.

Pilnyak [pēlnyāk', **Boris** (b. 1881). Pen-name of Boris Andreyevich Vagon, Russian short-story writer and novelist (*The Naked Year*, *Machines and Wolves*), 6-181.

Pilot. In shipping, person taken on board ship to conduct it through a difficult channel or river, or into or out of port.

Pilot, Automatic. Gyroscope and compass control of aircraft, keeping it on predetermined course; called "George" in R.A.F.

Pilot Officer. in R.A.F., 6-463.

Pilsen or Plzen. The 3rd city of Czechoslovakia; pop. 118,000; fine buildings; breweries; steel, machinery, and munitions; 3-22.

Pilsudski [pēlsūd'ski], **Josef** (1867-1935). Polish soldier and politician. 1st president of Polish republic, 1919-21; 6-240, 4-302.

Pimento. Variety of spice called also allspice and Jamaica pepper, 6-121.

Pimpernel. Name of several small plants, especially the scarlet pimper-

nel, *Anagallis arvensis*, a common garden weed, also known as "poor man's weather glass" because it closes its flowers at the approach of rain. It has simple, opposite leaves from whose axils appear the single scarlet flowers. Other species are bog pimpernel (*A. tenella*), a creeping form with very pale pink, delicate flowers, and tiny leaves; and yellow pimpernel (*Lysimachia nemorum*), which is really a species of loosestrife.

Pin, 6-202.

Pinaceae. Family of coniferous trees which includes the pines. *See* Pine.

Pinar del Rio [pénahr' del río], Cuba. Inland city 85 m. s.w. of Havana; pop. 64,000; tobacco centre.

Pinchbeck. Alloy of nine parts copper, one part zinc. Formerly used for making imitation gold jewelry (hence synonym for anything cheap). Named after its inventor, Christopher Pinchbeck (d. 1732), London clockmaker. Superseded by rolled gold.

Pin'dar (c. 522-443 B.C.). Gk. lyric poet, master of "the grand style in simplicity," 4-93, 92 illus.

Pindar'ies. Loose and irregular odes, in imitation of Pindar, fashionable in Eng. at close of 17th and beginning of 18th cent.

Pin'dus Mts., main range of Greece, running from N.W. to S.E.; source of principal rivers in Greece.

Pine, a cone-bearing tree, 6-203, 7-310 illus. f., 2-484; cones, 2-483 illus.; amber, 1-131; compare with fir, 3-355.

Pineal Body or Gland, in the human brain; may be vestige of a third eye.

Pineapple. A fruit, 6-204.

Pine Islands. Group of small isls. off N.E. coast of Honshu, Japan, about 800 in number, 4-342.

Pine Marten. Animal of the weasel family, 5-137 with illus.

Pinsor, Sir Arthur Wing (1855-1934). Brit. playwright; chief works, *The Second Mrs. Tanqueray*, *His House in Order*, *Trelawny of the Wells*; 3-291.

Pines, Isle of. Fertile isl. belonging to Cuba, about 40 m. S. of W. coast; 1,180 sq. m.; pop. 5,000; cap. Nueva Gerona; also island 58 sq. m., S. Pacific, S.E. of New Caledonia.

Pingyang or Hellsu-fu, Korea. Walled city, 40 m. from W. coast; pop. 285,900; great strategic importance.

Pin'kerton, Allan (1819-81). Amer. detective, b. Glasgow, Scot.; organized (1861) Federal secret service and founded a famous private detective agency.

Pink-footed Goose, 4-47; migration, 5-204 illus. f.

Pinks. Flowering plants of the genus *Dianthus*, 6-205.

Pinnace. Light sailing boat, generally schooner-rigged. Also, a warship's boat propelled by oars, sail, steam or motor.

Pinnate Leaves, 4-470, 471 illus., 6-50 ash as example, 1-263 illus.

Pinak. Town of White Russia S.S.R. (Polish 1921-30); pop. 40,000; on the r. Pripiet, 105 m. E. of Brest-Litovsk; formerly cap. of separate principality.

Pint. A unit of measure. *See* Weights and Measures.

Pin'ta. One of the 3 carvels used by Columbus on his first voyage to America.

Pin'tail, duck, 3-131 illus.

Pinto, Fernão Mendes (1509-83). Portuguese adventurer; companion of Francis Xavier on mission to Japan; his description of unknown Japan, long regarded as a sort of Münchhausen tale. "did for prose of Portugal what Camoens did for poetry."

Pin-tumbler loak, "Yale" type, 4-536 with diag.

Pinturicchio [péntoorék'yó] ("little painter"), Bernardino, "Basel name" of Bernardino di Betti (1454-1513). It. artist, one of the foremost painters of Umbrian school, 4-318.

Pinnon [pénthón']. Family of Sp. navigators, three of whom, Martin

Alonso, Francisco, and Vicente Yañes (brothers), were companions of Columbus in discovery of Amer.; discovery of Brazil, 2-49.

Piozzi [piót'ái]. Heister Lynch, friend of Dr. Johnson. *See* Thrals, Heister.

Pipe, for smoking; corn-cob pipes, 5-91.

Pipe. Old Eng. measure of liquid capacity, chiefly for wine. A pipe of madeira contained 92 galls.; of sherry 108 galls.; of port 115 galls.

Pipefish. Long slender fishes with tubular snouts belonging to family *Synbranchidae*, which also includes sea-horses.

Pipelines. For petroleum, laid above or below ground; steel piping generally used for conveying oil from wells to reservoirs. *See* Petroleum.

Pipe of Peace. The "peace-pipe" or calumet of N. Amer. Indians; tobacco-pipe with stone bowl and long reed stem ornamented with eagles' feathers; smoked on ceremonial occasions, especially in making treaties of peace.

Pipes, in organ, 6-1, 2 illus.

Pipistrelle. Common Brit. bat, 1-381, 383.

Pipits. Small lark-like birds, 6 205.

Pippin (King of the Franks). *See* Pepin.

Piræus [pi'r'ús]. Chief port of Greece, port of Greater Athens; fortifications and long walls, 1-287, 1-290; illus., 4-79.

Pirandello [pirándel'lo], Luigi (1867-1936). It. dramatist; wrote a number of plays having as their main theme the power and prevalence of illusion in people's lives (*Six Characters in Search of an Author*, *As You Desire Me*); Nobel prize for literature in 1934; 4-330.

Pirate Bug. *See* Wheel Bug.

Pirates and Piracy, 6-208; Barbary corsairs, 5-260; Capt. Kidd, 4-402; Sir Henry Morgan, 5-262; Tripoli as base, 4-489.

Pirie, (Douglas Alastair) Gordon (b. 1931). Brit. athlete, great long-distance runner. Ran 1 miles in 18 min. 35.6 secs., 1953. World records for 3,000 and 5,000 metres, 1956. 6 miles in 28 min. 19.4 secs., 1953.

Pirithous [pi'rith'ús]. King of Laphia, friend of Theseus, 7-269.

Pirna. Tn. of Saxony, Ger., on Elbe; pop. 31,215. Prussians defeated Saxons in Seven Years' War in 1756, 7-2.

Pisa. City of N. It.; pop. 80,309; famous for leaning tower, 6-207.

Pisa, Council of (1409). Church council which deposed rival popes Gregory XI and Benedict XIII; Alexander V elected.

Pisano [pézh'án]o], Andrea ("Andrew of Pisa") (c. 1270-1349). It. sculptor, pupil of Giovanni Pisano; made gilded bronze doors on south side of Baptistery at Florence.

Pisano, Giovanni ("John of Pisa") (c. 1250-1330). It. sculptor, one of greatest of Renaissance, founder of It. Gothic style; son of Niccolò Pisano.

Pisano, Niccolò ("Nicholas of Pisa") (c. 1206-78). It. sculptor and architect, "first great precursor of the Renaissance."

Pisces [pis'és]. The fish class of vertebrate animals.

Pisces (Fishes). A sign of the zodiac, 7-524 illus.

Pisgah [piz'gah]. Mt. in Palestine from which Moses saw the Promised Land; identified with Nebo (Deut. xxxiv, 1).

Pisidia [piz'id'ia]. Anc. district of S. Asia Minor; mountainous, with wild and warlike inhabitants who kept independence against all successive rulers of Asia Minor until subdued by Rome.

Pisistratus. *See* Peisistratus.

Pispek (Kirghiz). *See* Frunze.

Pissarro, Camille (1831-1903). Fr. painter and etcher of impressionist school, 3-449, 4-237; his son Lucien (1863-1944), also a painter, worked in Eng., becoming a naturalised Brit. subject.

Pistachio nuts, 6-487 with illus.

Plata. Strip on which fencing takes place, 3-345.

Plat'ul. Seed-developing structure in flowers, 3-396, 397 diag., 2-23 illus. f.

Platol. A firearm, 3-360, 3-358 illus.:

X-ray photograph of, 7-508 illus.

Platon, in diesel engine, 3-89 with diag.; in internal-combustion engine, 4-273 diag.

Pl'um sat'vum. The garden pea.

Pita. Fibre of century plant, 1-68.

Pitcairn Island. Brit. possession in a Pacific Ocean; history of settlement, 6-31, 2-27; stamp, 6-30 illus.

Pitch. Product of distillation of wood-tar or coal-tar, 1-274, 7-227, 2-434.

Pitch, football, 3-416 with diag.; hockey, 4-183.

Pitoblennde, a source of uranium, 7-370

Pitober. In baseball, 1-377.

Pitcher Plants, 6-207, 217 illus. f.

Pitohorh, Vivian (b. 1895). Brit. artist, 2-263.

Pitoh Lake, in Trinidad, 7-317.

Pith. Spongy core of many plant stems.

Pithecanthropus erectus. The erect ape-man, or Java man, 5-105, 1-180.

Pliscus, Bartholomæus (1561-1613).

Inventor of decimal point, 3-59.

Pitlochry. Inland resort in Perthshire, Scot.; pop. 2,354; 6-138.

Pitman, Sir Isaac (1813-97). Brit.

inventor of Pitman system of shorthand, and a keen advocate of simplified spelling, 7-43.

Pitt, William (1759-1806). Brit. statesman, 6-208, 4-252, 7-465, 6-322.

Pitt, William, the elder. *See* Chatham, Earl of.

Pit'aeus (c. 652-569). Statesman of Mytilene; hero of war against Athens; restored order following civil strife; one of 7 sages.

Pitt Diamond. *See* Regent Diamond.

Pitti [pit'ti] Palace. In Florence, designed as a residence for Luca Pitti, chief magistrate of Florence in 1419, became home of famous picture collection; severely damaged in 2nd World War.

Pittsburgh, Pennsylvania, U.S.A.; pop. 676,806; 6-209, 6-119.

Pittsburgh, University of, Pennsylvania U.S.A., 6-209.

Pituitary Gland, 4-28.

Pius I (Pope c. 140-154), 6-208.

Pius II (Pope 1458-64), 6-209.

Pius IV (Pope 1559-65), 6-209.

Pius V (Pope 1566-72), 6-209.

Pius VI (Pope 1775-99), 6-209.

Pius VII (Pope 1800-23), 6-209.

Pius VIII (Pope 1829-30), 6-210.

Pius IX (b. 1792, Pope 1846-78), 6-210.

and Papal States, 4-316.

Pius X (b. 1835, Pope 1903-11), 6-210.

Pius XI (b. 1857, Pope 1922-39), 6-210.

Pius XII (b. 1876, Pope from 1939), 6-210.

Pixie Cup. Lichen found on heathland 4-490 illus.

Pizarro, Francisco (c. 1475-1541). Sp. conqueror of Peru, 6-210, 6-114 7-98, 4-508.

Place de la Bastille, Paris, 6-79.

Place de la Concorde, Paris, 6-79.

Place de l'Étoile, Paris, 6-83.

Place de l'Opéra, Paris, 6-79, 83 illus.

Place Names in England, 5-315, 3-282

Gaelic, 3-497.

Placentalia. Order of mammals in which young are completely developed when born, 6-103.

Placer Mining, 5-215.

Pladda. One of the seven islands of

Buteshire, Scot., 2-334.

Plague. *See* Black Death.

Plaice. *See* Fish (list).

Plains, in phylography; 6-187.

Plains of Abraham. *See* Abraham

Plains of.

Plainsong. Also called Gregorian Chant. System of music used in R.C. churches for most of liturgy. Said to have been systematised by St. Gregory the Great.

Planck, Max (1858-1947). Ger. physicist; devised Planck's constant quantum theory, 6-318.

PLANCK'S CONSTANT

Planck's Constant, in physics, 6-318.
Plane Kite, type of kite, 4-417.
Plane Mirror, images, 6-523 illus.
Plane of Saturation, in artesian well, 1-255 with illus.
Planetarium, construction and use, 6-214.
Planetesimal Theory, of planet origin, 6-214.
Plane Tree, 6-211.
Planets, 6-212, 7-188, 189; atmosphere of, 1-82; and Earth, 3-149; Kepler's laws of planetary motion, 4-401, and the zodiac, 7-324. See also names of individual planets.
Plancton. Floating mass of microscopic plants and animals found in ocean waters, eaten by whales and deep-sea fishes, 5-496, 3-379, 4-448, 6-298, 5-395; in Antarctic Ocean, 1-164; as a fertilizer, 1-104, 105.
Plano-concave Lens, 4-482.
Plantagenet (plantagenet), House of. Line of Eng. kings ruling 1154-1399; also called House of Anjou; founded by Henry II, 4-162, 3-276. See also Kings and Queens of England (list); English History.
Plantain. Genus of wild plants, growing as weeds, esp. the greater plantain, perennial herb with low-growing, tough, ribbed, flat leaves; and a spike of inconspicuous flowers; other species are the lamb's tongue, with pink flower spikes, sea plantain, etc.
Plantain. A type of banana tree or its fruit, 1-359, 360, 6-492 illus.
Plantations, or colonies, of English and Scots in Ireland, 4-282.
Plant-breeding, artificial pollination, 3-399.
Plantigrade animals. Those whose heels touch the ground, 5-109, 3-112.
Plantin, (plahntan), Christophe (1514-89). Fr. printer; his house and printing office in Antwerp now the Plantin-Moretus Museum, where his equipment may still be seen; 1-179.
Plantin. An old type revived by Monotype Corporation, 5-248.
Plant Life, 6-214; action of green plants on air, 1-81; algae, 1-104; compared with animal life, 1-154; for aquarium, 1-188; Arctic plants, 1-221; bacteria and nitrogen supplies, 1-344, 5-443; biology of, 1-148; botany, 2-24; selective breeding, 4-168; bulb, 2-118; cells, 7-512, 513, 7-308; cellulose in, 2-287; and climate, 2-410; collecting, 2-463; distribution of, 7-315; ecology, 3-158; enzymes, 3-294; flowers, 3-395; forests, 3-420; fruits, 3-478; fungi, 3-489; garden plants, 3-503, 504; grasses, 4-63; leaves, 4-469, 7-428, 429; lichens, 4-490; Linnaean system of classification, 4-515; essential to Man, 4-469; marine plants, 5-127; mosses, 5-272; moulds and mildews, 5-283; Nature study, 6-332; in ocean, 5-496; parasitic plants, 1-447; photosynthesis, 6-182; physiology of plants, 6-192; pitcher plants, 6-207; poisonous plants, 6-235; ability to make protein, 6-297; reproduction, 6-528, 7-429; respiration, 4-469, 470 diag., 7-430; roots, 6-451; seaweeds, 6-526; seeds and spores, 6-528; starch, 7-149; and formation of soil, 7-83, 7-313; trees, 7-308, 309-15 illus., 316, 317 illus. f.; water-plants, 7-429, 430; worts, 4-526; yeast, 7-512, 513.
Plant-house. See **Aphis**.
Plant parasites, 6-78; leaves of, 4-470.
Planudes, Maximus (c. 1340). Greek mathematician and grammarian of Constantinople; on addition, 1-17.
Plasma, Blood. See **Blood Plasma**.
Plasmodium. Genus of unicellular animals containing malaria parasite.
Plassey. Small town of India, 76 m. N. of Calcutta; battle (June 23, 1757), 2-411, 4-252.
Plaster of Paris, 4-112, 2-166.
Plastics, 6-219; acetylene in infr., 1-10; in gramophone records, 4-58; high frequency heating in infr., 3-223; nylon, 6-487.
Plastic sculpture, defined, 6-519.
Plastic surgery, 7-195.

Plataea (platē'a). Anc. city of Boeotia; assisted Athenians at battle of Marathon; battle of (479 B.C.), 1-237.
Plata, La (River Plate). Great estuary on E. side of S. Amer. formed by junction of Paraná and Uruguay rivers, 1-224, 225.
Plata, Battle of the River. Fought Dec. 13, 1939, between Ger. pocket battleship and Atlantic raider *Adm. Graf Spee* and Brit. cruisers *Achilles*, *Ajax*, and *Exeter*, which lay in wait 150 m. off Plata esty.; after 1 1/2 hrs. fight *Graf Spee* fled, disabled, into estuary nr. Montevideo pt., and 4 days later was scuttled; 6-252.
Plate, photographic, 6-181.
Plate. See **Architectural Terms**.
Plateau, in physiography, 6-187.
Plate girder, in bridge design, 3-62 with diag.
Plate glass, how made, 4-31.
Platelets, tiny particles in the blood; in clotting of blood, 1-490.
Platinum (Pt). White metallic element; atomic no. 78; atomic weight, 195.23; melting point 1,755° C.; 6-221, 3-224; and acids, 1-12; as setting for jewelry, 4-372.
Plato (427-347 B.C.). *Gk. philosopher, 6-222, 4-94; his Academy, 1-9; and Aristotle, 1-258; account of "Samothracian Rites," 5-31; and teachings of Socrates, 7-82.
Platoon, in Brit. army; subdivision of a company; further subdivided into sections.
Platte River. Largest tributary of Missouri, U.S.A.; length of main stream 200 m.
Platypus. The duckbill, an egg-laying mammal, 3-133.
Plautus (plaw'tus), Titus Maccius (c. 251-184 B.C.). Rom. comic dramatist; chief works, *Amphitruo*, *Capitru* (*The Captives*), *Aulularia* (*The Pot of Gold*); 4-450, 3-116.
Player-piano. See "Planola."
Playfair, Sir Nigel (1874-1934). Brit. actor and theatrical manager; gave new life to Eng. drama by his productions at the Lyric Theatre, Hammersmith.
Playing Cards. See **Cards**, **Playing**.
Plays. See **Drama**; **Theatre**.
Plebeians. Common people of anc. Rome; struggle for power, 6-429.
Plebiscite (pleb'isit). Vote by all electors on an urgent question of the day (= referendum).
Plecoptera. An insect order including stone-flies, 4-270.
Pleiades (plī'adēz). In Gk. myth. the seven daughters of Atlas; pursued by Orion, they were changed into doves by the gods.
Pleiades. In astronomy, the constellation of Taurus, a conspicuous star cluster, popularly regarded as the Seven Stars, though six stars only are as a rule visible, 2-490 diag.
Pleistocene Period. In geology, 3-515, 516, 4-228; Man in, 5-105.
Plesiosaurus, prehistoric reptile, 6-282, 283 illus.
Plevna or Plevan. Tn. in N. Bulgaria; pop. 31,500; celebrated for gallant resistance of Turks during siege in Russo-Turkish War (1877).
Plimer, Andrew (1763-1837). British miniaturist, 3-258.
Plim'soll, Samuel (1824-98). Brit. politician; he caused to be passed the Merchant Shipping Act (1876) which prohibited the sailing of overloaded and unseaworthy vessels; the Plim'soll mark, indicating the safety line of loaded vessels, is named after him, 7-32.
Plinth. In architecture, a square member forming the lower division of the base of a column, etc.
Pliny the Elder (23-79). Rom. writer and historian; his Natural history, 4-451, 7-526.
Pliny the Younger (61-c. 113). Rom. writer, 4-451.
Pliocene Period. In geology, 3-515, 516.
Ploesti. Tn. of Rumania 40 m. N. of Bucharest; pop. 105,100; petroleum centre; 6-470.

POCAHONTAS

Plotinus (plōtī'nus) (c. 205-270). Rom. philosopher, founder of Neo-Platonism; his philosophy is a development of the Platonic theory of Ideas, combined with Oriental mysticism.
Plough. Agricultural implement, 6-223, 1-71.
Plough, or Dipper. Constellation, 2-191, 490 diag.
Ploughshare Bridge, Brittany, 2-68.
Plovdiv. Tn. of Bulgaria; pop. 125,000; 3-119.
Plover (pluv'eri). Large family of birds, 6-226; foot, 1-471 illus.
"Plug and Feather", method of quarrying, 6-320.
Plum. Tree of genus *Prunus* 6-226; relation to almond, 1-117; fruit and blossom, 3-482 illus.; prunes, 6-208.
Plumage, of birds; moulting and coloration of, 1-469, 470.
Plumbago. See **Graphite**.
Plumbing. Trade originally confined to working in lead (Latin, *plumbum*), but now embracing the installing and repair of pipes, gutters, and similar fittings.
Plumer, Herbert, 1st Viscount (1857-1932). Brit. soldier; served in Boer War; during 1st World War commanded 2nd Army in France and later the Italian Expeditionary Force; governor of Malta 1919, and high commissioner and c.-in-c. Palestine 1925-26.
"Plum-pudding". Dog or Dalmatian. See **Dogs** (list).
Plumule (plū'mūl). First bud of an embryo.
Pluralists, in philosophy, those philosophers to whom the distinction and separateness between things seem most important, 6-160; also applied to persons who hold a large number of posts at the same time.
Plush. Cloth, 2-419.
Plutarch (c. A.D. 48-120). Gk. historian and biographer, 6-228, 4-14.
Pluto. In Gk. and Rom. myth., god of the underworld, 6-228; and Persphone, 3-69; and Perseus, 6-128; in the underworld, 7-322.
Pluto. Planet, 6-228, 6-213; orbit, 6-229 illus., 7-118 illus.; in solar system, 1-282.
Pluto (The Line Under The Ocean). Code name for supply pipes on sea bed carrying petrol to Allied armies in N.-W. Europe, 1944-45.
Plutonium (Pu). Chemical element; atomic no. 94; atomic weight 239; 3-224; nuclear fission and, 1-301, 302.
Plymouth. Spt. and naval base by s.w. Devon, Eng.; pop. 218,600; 6-229; breakwater, 2-54.
Plymouth Brethren. Religious sect founded at Plymouth, Devon Eng. in 1830, 3-461.
Plymouth Colony. Original settlement in Massachusetts, U.S.A., 5-144.
Plymouth Hoe. Ridge on which Plymouth, Eng. partly stands; Drake and bowls story, 6-229.
Plynlimmon. Mt. on borders of Montgomeryshire and Cardigan shires, Wales; source of the Severn, 7-1, 2-221, 7-412.
Plywood. Three or more layers of wood bonded together; by dielectric heating, 4-175; and plastic resins, 6-221.
Pizen. See **Pilsen**.
Pneumatic Machines, 6-230
Pneumatic riveter, used in ship-building, 6-230.
Pneumatic road-drill, 6-230 with diag.
Pneumatic tyre, invented by J. B. Dunlop, 3-16, 6-466.
Pneumogastric Nerve. See **Vagus**.
Pneumonia, form of, 5-52; antibiotics used in treatment of, 1-176.
Pnom-Penh. Commercial centre and cap. of Cambodia, Indo China, on r. Mekong; pop. 102,680; 2-181.
Po. Largest r. of Italy, 420 m. long, 6-231; valley, 3-309, 4-304.
Pocahontas (pōkahon'tas) (c. 1595-1617). Indian "princess," traditional ancestress of many Virginia families by her marriage to John Rolfe, a Jamestown settler; and Capt. John Smith, 6-372.

POCHARD

Pochard. Species of diving duck, 3-131; migration, 5-201 illus. f.

Pocket Borough. Before 1832, a borough of the U.K. in which parliamentary representation was controlled by a single man or small group who could dictate to electors how they should vote. Reform Act of 1832 abolished such boroughs.

Podebrady. See *George of Podebrady*.

Podgorica. See *Titograd*.

Poe, Edgar Allan (1809-49). Amer. writer, 6-232, 7-384.

Poe, Laureate 6-232.

Poetry, 6-233; ballad, 1-350; blank verse, 2-285, 286; Chaucer "father of English poetry," 2-311; for children, 2-356; heroic couplet, 2-287; lyric, 2-284; Marlowe's blank verse, 5-133; the sky-lark in poetry, 4-118; invention of sonnet form, 4-320; Wordsworth's theory, 7-477. See also *English Literature*; *France: Language and Literature*.

Poets' Corner, in Westminster Abbey, London, 7-444.

Point-à-Pitre. Largest tn. and chief port of Guadeloupe, Fr. W. Indies; pop. 41,823, 4-101.

Point Barrow, Alaska. The northernmost cape of N. Amer.; whaling station; school for natives; average pop. about 500. ●

Point de France, type of lace, 4-130.

Pointer. Breed of sporting dog, 3-102.

Poison gas, in warfare, 7-478.

Poisoning, first aid for, 3-380.

Poisons and Poisonous Plants, 6-235; disinfectants, 3-92; potato berries, 6-273; of snakes, 7-75.

Poitiers [pwahtyā]. Fr. tn. 60 m. s.w. of Tours; pop. 48,500; old churches, Rom. remains; Charles Martel defeated Moors near by (732); victory of Black Prince over French (1356), 4-204, 203 illus., 1-480.

Poitou [pwahtō]. Old prov. of w. Fr., part of Aquitaine; former cap. Poitiers.

Pola, Yugoslavia. Fortified tn. with one of finest harbours in Europe, on peninsula of Istria on Adriatic Sea; pop. 48,000; before 1914 chief naval station of Austria-Hungary; then It.; transferred to Yugoslavia in 1947, when about 25,000 Italians left the city.

Poland. Rep. of Eastern Europe, area (incl. occupied Ger. territory) 120,359 sq. m.; est. pop. 25,500,000; cap. Warsaw, 6-238; map, 6-238, 239, flag, 3-384 illus. f.; salt-mining, 6-191.

History: 6-210, 3-314, 7-335; first Partition, and Frederick the Great, 3-463; after 1st World War, 7-103, 7-183, 484; Paderewski, 6-32; claims on Czechoslovakia, 3-24; Polish Corridor and Danzig dispute with Ger., 3-49, 4-10, 7-186, in 2nd World War, 7-186, 7-196; Oder-Neisse Line, 6-299.

Polar bear, 1-392, 391 illus.

Polar Bond. See *Electrovalence*.

Polar Circles, 4-153.

Polar Exploration, 6-242; by air, 6-245; Amundsen, 6-214; Byrd, 2-147; Franklin, 6-242; Peary, 6-103; Scott's expedition, 6-515; Shackleton, 7-10. See also *Antarctica*; *Arctic Regions*.

Polarisation, of light, 4-501 with illus., 2-56; 7-228; and sugar, 7-186.

Polariscope. An optical instrument for exhibiting and analysing polarised light or objects in polarised light.

Polarity. The property of a magnetic body whereby certain characteristic qualities are manifested over certain regions of its surface. These regions are known as poles. On a magnet the poles are those points where the lines of force converge. In electrical engineering, the term polarity is applied to a machine or apparatus when it is necessary to indicate which terminal is positive and which is negative. Electric cells have a positive and negative terminal.

Polders. In the Netherlands, land rescued from the sea, 5-372; Lauwerzee polder, 5-379 illus.

Poldhu, Cornwall, Eng.; from here Marconi transmitted first radio signal across Atlantic (1901), 5-122, 6-342.

Pole, Reginald (1500-58). Eng. cardinal and Archbishop of Canterbury; opposed divorce of Henry VIII and compelled to leave England; a leader at Council of Trent; returned on accession of Mary.

Pole, Rod, or Persh. Unit of measure. See *Weights and Measures*.

Polecat. A small weasel-like animal, noted for its unpleasant odour; usually of a dark brown colour; nearly extinct as a wild animal in Britain; semi-domesticated as the ferret.

Polemoscope. Early periscope, 6-126.

Poles. People of Poland belonging to the western branch of the Slavs; characteristics, 6-238.

Poles of magnet, 5-82.

Pole Star, or Polaris, 7-147; and navigation, 5-339.

Pole-vault. In athletics, 1-292, 291 illus.

Poleynes. In armour, 1-214.

Pollos, 6-247; Brit. military, 1-252; cadet force, 2-159; careers in, 2-238; fingerprint identification, 3-353; in Japan, 4-350 illus.; in Liechtenstein 4-391, motor-cyclists 5-273; in New York, 5-416; force established by Peel, 6-105; dogs, 3-100, 101 illus.; Spanish, 7-105.

Poliohinelle, Fr. for It. *Pulcinella* (g.v.).

Polioomyelitis. Infectious virus disease of nervous system, attacking chiefly children and young adults; mild form curable; severe form may induce paralysis; viruses and, 4-14; physiotherapy and, 6-193 illus.

Polish Corridor. Narrow strip of land along the Vistula r. which cut through Ger. territory 1919-39 seized by Hitler, 7-186, 6-240.

Polish Language, Latin alphabet, 6-238.

Politian [polish'ian], Angelo (1454-94). It. scholar and poet: the greatest of his time.

Political Economy. See *Economics*.

Politics, 6-254; in *Gr. Brit.*, 4-50, 51.

Polk, James Knox (1795-1849). 11th & pres. of U.S.A., from 1844 to 1849.

Polka. A round dance, of Bohemian origin, in two-four time. Popular during latter half of 19th cent., 3-37.

Pollen grains. The fertilising element of flowers, 3-396, 397 diag., 399 illus.; and honey bee, 1-405; and humblebees, 1-407; in plant anatomy, 2-25 illus. f.

Pollination. Fertilisation of flowers, 3-396; cross-pollination, 3-399; by insects, 3-400.

Poll Tax. A tax on every poll or head, introduced into Eng. in 1377, but abolished by William III in 1689; a cause of 'Peasants' Revolt in Eng.

Pollucite. Mineral, source of the metal caesium, 5-90.

Pollux. Star of the first magnitude, 7-116.

Polo, Marco (c. 1254-1324). Venetian traveller, 6-255; visit to China, 2-368; and eastern exploration, 1-832; and Hangchow, 4-126; introduction of ice-cream, 4-230; visit to Japan, 4-314; and Kublai Khan, 5-238.

Polo, Nicolo. Venetian traveller, father of Marco Polo; travels, 6-255.

Polo. A ball game played on horseback, 6-254.

Polonium (Po). Radioactive metallic element of the oxygen group; atomic no. 84; atomic weight 210; 3-221, 3-11; radio-active properties, 6-351.

Polperro. Fishing vil. of Cornwall, 2-508, 3-256 illus.

Poltava [pol'ta-va]. Tn. in Ukraine S.S.R., 220 m. s.e. of Kiev; pop. 130,300; trade in cattle, grain.

Polyandry. Form of marriage in which a woman has two or more husbands, 5-133.

Polyanthus. Herbaceous perennial flowering plant, 6-256 with illus. f.

Polybius [polib'ius] (c. 201-125 A.C.). (Gk. historian of Rome.

● **Polyeap** [pol'ikarp] (c. 69-c. 135). Christian martyr, Bishop of Smyrna; called on to revile Christ, replied, "Eighty and six years have I served Him, and He hath done me no wrong.

POMPEII

How can I revile my Lord and Saviour?" martyred by Romans.

Polyconic projection, in map-making, 5-118.

Polydees. In Gk. myth., king who sent Perseus to kill Medusa, 6-128.

Polyester Resin, a thermosetting plastic; uses, 6-221.

Polygamy. The union of one man with several women, 5-133; among birds, 1-457; and Mahomedanism, 5-89.

Polygnotus. Gk. painter of 4th cent., 4-89.

Polygon (in geometry). A plane figure with more than four sides.

Polygonaceae [poligon'ia-see]. The dock family of plants.

Polyhymnia [polihim'nia]. In Gk. myth., Muse of sacred songs, 5-299.

Polymerisation, process in making plastics, 6-219.

Polymorphism, in peoples of mankind, 6-333.

Polynesia [polin'ezh'ia]. A division of the Pacific Isls., in a belt chiefly within 30 degrees on each side of the Equator, 6-26; racial characteristics of people, 6-28.

Polynices [polin'sez]. In Gk. myth., son of Oedipus, king of Thebes, and brother of Eteocles; tradition had it that the two brothers should rule by turn, a year at a time; at the end of the first year, however, Polynices brother refused to give way, and was followed in which both were killed, 5-305.

Polyp. Coral polyps, 2-504; stage in life of jelly-fish, 4-360, 361 illus. f.

Polypetalae. Division of the Angiosperm group of plants.

Polyphase Circuits (electricity), 3-213.

Polyphemus. In the *Odyssey*, Cyclops from whom Odysseus escaped by putting out his eye; 5-501, 3-16.

Polyphony, in music and madrigals, 5-304.

Polyphy [pol'ipōdī]. A common British fern, often seen growing in the moss of old oak trees or similar situations. Distinguished by its simple pinnate fronds.

Polystyrene, a plastic, 6-220.

Polytechnic (Gk. "many arts"). Applied to schools with a varied curriculum of practical instruction in applied arts and sciences. First in England was the Regent St. Polytechnic, London, founded by Quintin Hogg in 1882. French Ecole Polytechnique, at Paris, established in 18th century.

Polytheism (Gk. "many gods"). The belief in and worship of many gods as opposed to monotheism, the belief in one God, the belief still extant has been common among people since the dawn of history.

Polythene, a plastic; uses, 6-221.

Polythysana rubescens moth, 2-143.

Polyvinyl Chloride, source of a plastic material; 6-220.

Pombal, Sebastião José de Carvalho e Melo, Marquis of (1690-1782). Premier of Portugal under King Joseph, called the "Great Marquis"; expelled Jesuits, rebuilt Lisbon after great earthquake 1755 and freed Indian slaves in Brazil.

Pomegranate. Fruit, 6-256.

Pomelo. See *Grape-Fruit*.

Pomerania. Former agric. prov. of Prussia on Baltic Sea; chief t. Oder; large sea trade, of which Stettin was centre; largely incorporated in Poland in 1915.

Pomeranian dog. Breed of "toy" dog, 3-101.

Pomona. Rom. goddess of fruits and gardens; and Halloween festival 4-120.

Pomona (Orkney Isls.). See *Mainland*.

Pompadour, Jeanne Antoinette Poisson Marquise de (1721-64). Favourite and powerful political adviser of Louis XV of France.

Pompeii. Anc. Rom. city destroyed by eruption of Mt. Vesuvius A.D. 79 6-256; excavations, 1-206; excavated house, 6-448 illus.; fresco 6-445 illus.; fountain, 6-257 illus. f.; mosaic of Plato's academy, 1 illus.; soap factory, 7-78.

POMPEY

Pompey. Nickname given to Portsmouth by sailors; suggested origins of, 6-286.

Pompey the Great (108-48 B.C.). Rom. general and statesman, 6-258; and Brutus, 2-101; and Caesar, 2-161, 162; and the Jews, 4-375.

Pompey's Pillar. Alexandria, Egypt, 1-101 illus.

Pom-pom Gun. A naval anti-aircraft weapon, 1-174.

Ponce (pón'thá). 2nd city of Puerto Rico, 3 m. from s. coast; pop. 105,000; tobacco mfrs.; exports coffee and sugar from port at Playa de Ponce.

Ponce de Leon (pón'thá dā lāón'). Juan (c. 1460-1521). Sp. explorer, accompanied Columbus to America in 1493, was governor of Puerto Rico in 1510, and discovered Florida in

1513; was killed on returning there in 1521; 1-133, 3-303, 6-303.

Ponce de Leon, Pedro (c. 1520-1581). Sp. monk, educator of deaf, 3-56.

Ponchielli, Amilcare (1834-86). It. composer, 5-513.

Pondicherry. Former Fr. settlement on Coromandel coast, India, 4-240, 252

Pons Fabricius. Roman bridge over the Tiber, 2-64.

Pons Subilius. Bridge over the Tiber held by Horatius, 2-62.

Ponta Delgada. Tn. on St. Michael's Is., Azores; pop. 21,000; 1-330.

Pont du Gard. Rom. structure carrying aqueduct across the valley of r. Gard, France; 1-190, 189 illus.

Pontefract Cakes. Liquorice in, 4-521.

Pontiac (c. 1712-89). Ottawa Indian chief, organizer of "conspiracy of Pontiac" (1763-65) against Brit.

Pontine Marshes. Former swampy region in w.-cent. It., near Rome; the malarial atmosphere prevented cultivation, reclaimed under Fascist régime, and became new prov. of Littoria, developing into rich wheat-growing district, 6-427.

Pontoons. Flat bottomed boats for supporting floating bridge, 2-68.

Pontos Euxinos. See Black Sea.

Pontus. Anc. region in S.E. Asia Minor on Black Sea; originally part of Cappadocia; kingdom founded 4th cent. B.C.

Pontypool. Tn. of Monmouthshire; pop. 42,683; 5-245.

Pontypridd, Wales. Tn. in Glamorgan-shire, at junction of rvs. Rhonda and Taff, about 12 m. S.W. of Cardiff; tinplate and iron goods, and brass founding; pop. 38,622.

A LIST OF THE POPES FROM ST. PETER

(Names of doubtful popes and antipopes are in square brackets)

died 677	Peter	625-638	Honorius I	994-985	Boniface VII	1316-34	John XXII
67-79?	Linus	638-640	Severinus	985-986	John XV	[1328-30]	Nicholas V
79-90?	Anacletus	640-642	John IV	986-999	Gregory V	1334-42	Benedict XII
90-99?	Clement I	642-649	Theodore I	[997-998]	John XVI	1342-52	Clement VI
99-107?	Evaristus	649-655	Martin I	999-1003	Silvester II	1352-62	Innocent VI
107-116?	Alexander I	654-657	Eugenius I	1003	John XVII	1362-70	Urban V
116-125?	Sixtus I	657-672	Vitalianus	1003-09	John XVIII	1370-78	Gregory XI
	(Xystus)	672-676	Adeodatus II	1009-12	Sergius IV	1378-89	Urban VI
125-136?	Telesphorus	676-678	Donus	1012-24	Benedict VIII	[1388-91]	Clement VII
136-140?	Hyginus	678-681	Agathon	1024-32	John XIX	1389-1404	Boniface IX
140-154	Pius I	682-683	Leo II	1032-45	Benedict IX	[1394-1423]	Benedict XIII
154-165?	Anicetus	684-685	Benedict II	[1015]	Silvester III	1404-08	Innocent VII
165-174	Soter	685-686	John V	1045-48	Gregory VI	1406-15	Gregory XII
174-189	Eleutherius	686-687	Conon	1046-47	Clement II	1409-10	Alexander V
189-198	Victor I	687-701	Sergius I	[1017-18]	Benedict IX	1410-15	John XXIII
198-217	Zephyrinus	701-705	John VI	1048	Damasus II	1417-31	Martin V
217-222	Calixtus I	705-707	John VII	1049-54	Leo IX	[1421]	Benedict XIV
222-230	Urban I	708	Sisinnius	1055-57	Victor II	[1421-29]	Clement VIII
230-235	Pontianus	708-715	Constantine I	1057-59	Stephen IX	1431-47	Eugenius IV
235-236	Anterus	715-731	Gregory II	[1058-59]	Benedict X	[1439-49]	Felix V
236-250	Fabian	731-741	Gregory III	1059-61	Nicholas II	1447-55	Nicholas V
251-253	Cornelius	741-752	Zacharias	1061-73	Alexander II	1455-58	Calixtus III
[251-252]	Novatianus	752	Stephen	[1061-64]	Honorius II	1458-64	Pius II
253-254	Lucius I	752-757	Stephen II	1073-85	Gregory VII	1464-71	Paul II
254-257	Stephen I	757-787	Paul I	[1084-1100]	Clement III	1471-84	Sixtus IV
257-258	Sixtus II	787-788	Constantine II	1086-87	Victor III	1484-92	Innocent VIII
259-268	Dionysius	788-772	Stephen III	1088-99	Urban II	1492-1503	Alexander VI
269-274	Felix I	772-795	Adrian I	1099-1118	Paschal II	1503	Pius III
275-283	Eutychianus	795-816	Leo III	[1105-11]	Silvester IV	1503-13	Julius II
283-296	Gaius	816-817	Stephen IV	1118-19	Gelasius II	1513-21	Leo X
296-304	Marcellinus	817-824	Paschal I	[1118-21]	Gregory VIII	1522-23	Adrian VI
308-309	Marcellus I	824-827	Eugenius II	1119-24	Calixtus II	1523-34	Clement VII
309	Eusebius	827	Valentine	1124-30	Honorius II	1534-49	Paul III
310-314	Melchior	827-844	Gregory IV	[1124]	Celestine II	1550-55	Julius III
314-335	Silvester I	844-847	Sergius II	1130-43	Innocent II	1555	Marcellus II
336	Marcus	847-856	Leo IV	[1130-38]	Anacletus II	1555-59	Paul IV
337-352	Julius I	[855]	Anastasius	1138	Victor IV	1559-65	Pius IV
352-366	Liberius	855-858	Benedict III	1143-44	Celestine II	1566-72	Pius V
[355-365]	Felix II	858-867	Nicholas I	1144-45	Lucius II	1572-85	Gregory XIII
366-384	Damasus I	867-872	Adrian II	1145-53	Eugenius III	1585-90	Sixtus V
384-398	Siricius	872-882	John VIII	1153-54	Anastasius IV	1590	Urban VII
398-401	Anastasius I	882-884	Marinus I	1154-59	Adrian IV	1590-91	Gregory XIV
402-417	Innocent I	884-885	Adrian III	1159-81	Alexander III	1591	Innocent IX
417-418	Zosimus	885-891	Stephen V	[1159-61]	Victor IV	1592-1605	Clement VIII
418-422	Boniface I	891-896	Formosus	[1161-68]	Paschal III	1605	Leo XI
422-432	Celestine I	896	Boniface VI	[1168-78]	Calixtus III	1605-21	Paul V
432-440	Sixtus II	896-897	Stephen VI	[1179-80]	Innocent III	1621-23	Gregory XV
440-461	Leo I	897	Romanus	1181-85	Lucius III	1623-44	Urban VIII
461-468	Hilarius	897	Theodore II	1185-87	Urban III	1644-55	Innocent X
468-483	Simplicius	898-900	John IX	1187	Gregory VIII	1655-67	Alexander VII
483-492	Felix II (III)	900-903	Benedict IV	1187-91	Clement III	1667-69	Clement IX
492-496	Gelasius I	903	Leo V	1191-98	Celestine III	1670-76	Clement X
496-498	Anastasius II	903-904	Christopher	1198-1216	Innocent III	1676-89	Innocent XI
498-514	Symmachus	904-911	Sergius III	1216-27	Honorius III	1689-91	Alexander VIII
514-523	Hormisdas	911-913	Anastasius III	1227-41	Gregory IX	1691-1700	Innocent XII
513-526	John I	913-914	Lando	1241	Celestine IV	1700-21	Clement XI
526-530	Felix III (IV)	914-928	John X	1243-54	Innocent IV	1721-24	Innocent XIII
530-532	Boniface II	928	Leo VI	1254-61	Alexander IV	1724-30	Benedict XIII
533-535	John II	928-931	Stephen VII	1261-64	Urban IV	1730-40	Clement XII
535-536	Agapetus I	931-936	John XI	1265-68	Clement IV	1740-58	Benedict XIV
536-538?	Silverius	936-939	Leo VII	1271-76	Gregory X	1758-69	Clement XIII
539-555	Vigilius	939-942	Stephen VIII	1276	Innocent V	1769-74	Clement XIV
556-561	Pelagius I	942-946	Marinus II	1276	Adrian V	1775-99	Pius VI
561-574	John III	946-955	Agapetus II	1276-77	John XXI	1800-23	Pius VII
575-579	Benedict I	955-964	John XII	1277-80	Nicholas III	1823-28	Leo XII
579-590	Pelagius II	963-965	Leo VIII	1281-85	Martin IV	1829-30	Pius VIII
590-604	Gregory I, the Great	964	Benedict V	1285-87	Honorius IV	1831-46	Gregory XVI
		965-972	John XIII	1288-92	Nicholas V	1846-78	Pius IX
604-606	Sabinianus	973-974	Benedict VI	1294	Celestine V	1878-1803	Leo XIII
607	Boniface III	[974]	Boniface VII	1294-1303	Boniface VIII	1903-14	Pius X
608-615	Boniface IV	974-983	Benedict VII	1303-04	Benedict XI	1914-22	Benedict XV
615-618	Adeodatus I	983-984	John XIV	1305-14	Clement V	1922-39	Pius XI
619-625	Boniface V					1939-	Pius XII

PONY

Pony Use in coal-mines, 2-433; in polo, 6-254, 265 illus., 4-196 illus. f.; Shetland, 7-27.

Pony Express. Old mail service from St. Joseph, Missouri, to Sacramento, California, 2-109.

Poodle. Breed of dog, 3-100 illus. f.

Pools. Spt. tn. in Dorset, Eng.; isl.-studied harbour; Brankaea or Brownsea Isl has 16th-cent. castle; coasting trade and boatbuilding; potters' clay worked; potteries, iron foundries, agric. implement works, mfrs. cordage, sailcloth; pop. 82,958. 2-107.

Pool of London, The. Name given to the Thames between London Bridge and Tower Bridge, 5-20, 7-363.

Poons. Tn. in Bombay state, India; pop. 258,197; 1-517.

Pop. See Nautical Terms (list).

Pop Clares. Order of Franciscan nuns, founded by St. Clare, 2-457.

Poor Man's Bible. Early Bible printed from engraved wood blocks, 6-289, 290 illus.

Poor Man's Weather Glass. The scarlet pimpernel; see *under* Pimpernel.

Pop-corn. A sweetmeat made from maize, 5-90.

Pope, The. Bishop of Rome, 2-380, 6-426, office and authority of, 6-60, the Vatican 7-382, 383 with illus. See also *Popes* (list of, previous page).

Pope, Alexander (1688-1744). Eng. poet, 6-258, 3-288.

Popinjay. Old archery mark, 1-207.

Popish Plot. Between 1678 and 1680 Titus Oates made repeated efforts to prove by false testimony and forged papers that the Queen and some of the leading Eng. Rom. Catholics were plotting to murder Charles II and restore Rom. Catholicism as the state religion; popular feeling ran high; a number of Jesuits and other Rom. Catholics were executed.

Poplar. Met. bor of London, pop. 73,544. 5-27.

Poplar. Tree, 6-259, 7-314 illus.

Poplar Hawk moth, 2-144 illus.

Pop lin. A fabric with a warp of silk and a heavier filling of worsted, cotton, or linen, which gives the material a corded surface; name may come from "Pope," for fabric was first manufactured at Avignon, once a papal residence.

Popocatepetl [popōkatē'petl]. Mt. Volcano about 40 m. s. of Mexico City; one of the highest peaks in N. Amer. 17,887 ft., 5-186.

Poppea Sabina [popē'a sabī'na] (d. A.D. 65). Second wife of Nero, 5-367.

Poppy. Flower, 6-259; section of ovary, 3-395 diag.; seeds, 6-528.

Poppy Day. See Remembrances Day.

Poppy Fund. Haig and, 4-117.

Population, and food supply, Malthus's theory, 3-410, 411, 412.

Porbeagle. Variety of shark, 7-18 with illus.

Porcelain. See Pottery and Porcelain.

Porch. In architecture, a covered entrance to a building; a covered approach or vestibule to a doorway in U.S.A. a veranda.

Porcupine. A rodent, 6-260; story, *Prickles Learn to Like his Quills* 6-261-64; modified hair, 5-100.

Porcupine Mountains, Michigan, U.S.A., 5-192.

Pore. Minute opening in the skin through which gland secretions (sweat) reach the surface.

Pores, of leaves, and respiration of plants, 4-469.

Porifera. See Sponges.

Pork. Meat; apple sauce, and digestion, 3-90; as food, 6-197; Norman name, 6-183; "porker" pig type, 5-154.

Pork-flab, 5-128 illus.

Porphyry. Lava containing a mass of small crystals, 4-156.

Porpoise. A marine mammal, 6-265; in Antarctic Ocean, 1-169, distinguished from dolphin, 3-105.

Porpora, Nicola (1686-1768). Ital. composer and singing teacher; and Haydn, 4-142.

Porrey Cross. Part of a loom; in weaving, 5-37.

Porridge, as food, 5-490.

Porruena, Lars. Etruscan prince who was defeated by Horatius Cocles before the gates of Rome, 6-429.

Port. A Portuguese wine; brandy in, 1-86; Douro valley vineyards, 6-267.

Port. See Nautical Terms (list).

Port. "Wheel to port," since Jan. 1933, has meant that a captain wishes his vessel to turn to the left.

Porta, Giambattista della (1638-1615). It. scientific experimenter, who dabbled in alchemy, biology, magnetism, etc.; described early camera obscura; and first steam engine, 7-152.

Portal Circulation, of blood, 4-624.

Portal of Hungerford, Marshal of the R.A.F. Charles F. A. Portal, 1st Viscount (b. 1893). Brit. airman; A.O.C.-in-C. Bomber Command, 1940; Chief of Air Staff, 1940-45, head of min. of supply dept. concerned with work on atomic energy awarded O.M. 1946.

Portal, of Laverstoke, Wyndham R. Portal, 1st Viscount (1885-1949) Brit. industrialist and politician, chairman coal production council 1940-49; as min. of works and planning, 1942-44, gave name to Portal prefabricated house.

Port Antonio. Tn. in Jamaica; pop. 5,482; 4-337.

Port Arthur, Ontario, City on Lake Superior, grain and coal-shipping centre of W. Canada; pop. 31,161.

Port Arthur. Former Russ. naval base on Liaotung peninsula, Manchuria; handed to China, 1955. 5-112.

Port-au-Prince. Cap. and chief port of Haiti, W. Indies; pop. 424,158; 4-118.

Port Elizabeth. 2nd city of Cape of Good Hope, S. Africa, spt. 400 m. E of Cape Town, on Algoa Bay; pop. 215,416; ostrich feathers, jam boots and shoes; 7-88.

Porter, Cole (b. 1892). Amer. composer and song writer; "Night and Day," "The Skull of the Night," "Begin the Beguine"; also musical plays *Gay Divorce*, *Anything Goes*.

Porter, Edwin S. Amer. film producer; and *The Great Train Robbery* (1903), 2-395, 397 illus.

Porter. Dark bitter beer, brewed from brown malt, named from popularity among 18th-cent. market porters.

Port, Erin. Tn. and holiday resort in Isle of Man, pop. 1,435, 5-110.

Port Glasgow. Spt. on r. Clyde, Renfrewshire, Scot. Industries include shipbuilding and mfr. of rope and sailcloth; pop. 21,612. 6-388.

Port Harcourt. Tn. in Nigeria; pop. 72,000, 5-435.

Portia. Heroine of Shakespeare's *The Merchant of Venice*, 5-173.

Port Jackson, N.S.W., Australia. The fine natural harbour on which the town of Sydney is built. 7-216.

Portland, Maine, U.S.A. Largest city and chief spt. in state on Casco Bay, 50 kn. s.w. of Augusta, pop. 77,634; shoes, ships, machinery, lumber products, fish, burned by British in 1775, 5-90.

Portland, Oregon U.S.A. Largest city of state; pop. 373,628. Important lumber mfg. and shipping centre; large trade in wheat, and extensive furniture, flour, and paper industries 5-532.

Portland. Peninsula on s. coast of Dorset, Eng., 6-265, 3-107, 108, 2-54.

Portland, Battle of. Fought Feb 18-20, 1653, between the Eng. and the Dutch; the Dutch under Tromp attacked the Eng. fleet under Blake, but were driven off and lost many ships.

Portland Bill, Dorset, Eng., 6-265, 3-247.

Portland cement, discovery and production methods, 2-289.

Portland Roads. Naval anchorage off Portland, Dorset, Eng., 6-265.

Portland stone, 6-265, 4-510.

PORTUGAL

Portland Vase. Beautiful dark-blue glass urn with figures in white; found in tomb near Rome; deposited in British Museum 1810; bought by B. M. 1945; broken by a madman in 1845 but skilfully repaired; 2-89 illus.

Portloughish [portlō'ahz], or Maryborough, co. Lk. of Leix, Irish Republic; pop. about 12,000.

Port Lockroy. Falkland Is. Dependencies; scientific base camp, 1-170.

Port Louis. Cap. of Mauritius, pop. 75,845; 5-149.

Port Mahon. Spt. and cap. of Minorca, one of Balearic Is.

Port Moresby. Tn. New Guinea, h.q. of Australian admin. area; pop. 3,600. 5-397; in 2nd World War, 7-493.

Porto Alegre [portō'alē'grā]. Port and cap. of state of Rio Grande do Sul, Brazil, near N. extremity of Lake Patos; pop. 321,600.

Portobello. Port on Atlantic coast of Isthmus of Panama 20 m. N.E. of Colon; pop. 9,900 once shipping point for Spanish treasure from Peru.

Port of entry. Any point, whether on the frontier or not, designated by the customs authorities as a place where merchandise or persons may enter or pass out of a country.

Port of London Authority (P.L.A.). Controls all matters concerning traffic, locks, ferries, etc., from the estuary of the Thames to the end of the tidal portion (Teddington), 7-263. 5-20.

Port of Spain or Spanish Town. Cap. of Trinidad, Brit. W. Indies; pop. 108,273; 7-317.

Porto Novo. Chief town of Dahomey, French West Africa; pop. 31,000. 7-440.

Porto Santo. Second largest isl. of the Madeiras, 5-68.

Portovenere. Village, Italy, 4-315 illus.

Port of entry. Variety of marble from, 5-121 illus.

Port Pirie. Spt. of S. Australia, pop. 12,000; exports ore, wheat; 7-102.

Portrait painting. English school 3-259, 260 illus. f.; Flemish school 6-34. See also articles on the great portrait painters, e.g. Rembrandt, Reynolds, Velazquez.

Portrait photography, 6-174, 175 illus.

Port Royal. Spt. and naval station of Jamaica; headquarters of the Brit. naval forces in the W. Indies, badly damaged by hurricane 1951.

Port Royal, Nova Scotia. Former name of Annapolis (q.v.).

Port-Royal des Champs. Celebrated Fr. nunnery about 8 m. s.w. of Versailles, established in 1204, transferred to Paris in 1626, it became a prominent Jansenist and educational centre, but in 1709 the nuns were expelled, and the following year the nunnery was demolished; Racine at, 6-334.

Portrush, co. Antrim, N. Ireland, golf links, 1-178. Giant's Causeway, 4-18.

Ports, and harbours, 4-130, 131.

Port Said. Egypt, spt., N. outlet of Suez Canal; pop. 178,000. 3-172, 173, illus., 7-180 map 181.

Port St. Mary. Tn. and holiday centre in Isle of Man; pop. 1,399, 5-110.

Portsmouth. Important spt. and naval base in Hants, Eng. on the Itchen Channel; pop. 235,464, 6-265, 266 illus., 4-124.

Portsmouth, Virginia, U.S.A. Twin city of Norfolk; pop. 80,039; Norfolk Navy Yard, 7-403.

Portstewart. Tn. in co. Londonderry, N. Ireland; pop. 3,563; 5-31.

Port Sunlight. Tn. of Cheshire, 3 m. s.e. of Birkenhead; laid out in 1884 by Lever Bros. as a model garden town for their employees.

Port Talbot. Spt. in Glamorganshire, Wales; pop. 44,000; Margam steel works, 4-27.

Portugal. Republic of s.w. Europe area (incl. Azores and Madeira) 35,470 sq. m.; pop. with Azores and Madeira, 8,490,455; 6-267; flag 2-384 illus. f.; bull-fighting, 2-122; cork forests, 2-605; seaweed in dustry, 1-105, illus. f. History: 6-269; 15th cent. discoveries and Columbus, 1-132, 133.

PORTUGAL LAUREL

134; settlements in Africa, 1-35, 1-53; medieval trade with Asia, 1-270; trade with India, 4-351; settlements in Ceylon, 2-297; and Brazil, 2-49; Inquisition, 4-285.

Portugal Laurel, 4-455.

Portuguese East Africa. See *Mozambique*.

Portuguese Guinea. Territory on W. coast of Africa enclosed on land side by Fr. territory; includes adjacent Bissagos or Bijagoz Is., 13,948 sq. m.; pop. 517,249; 7-440.

Portuguese Language, development from Latin, 4-449.

Portuguese Man-of-War, type of jelly-fish, 4-360 with illus. f.

Portuguese Rose. Variety of marble, 5-191 illus. f.

Portuguese Timor. Eastern portion of Timor in Malay Archipelago; area 7,330 sq. m.; pop. 442,378; cap. Dilly; products; 6-268.

Portuguese West Africa. See *Angola*.

Posidon [po-'don]. In Gk. myth., god of the sea; Neptune identified with, 6-270, 7-522, 8-367.

Posen. See *Poznan*.

Positive. Term applied to one of two points between which there is passage of an electric current. Positive distinguishes that point which corresponds, as far as the tendency to set up a current in an external circuit is concerned, to the copper plate of a Daniell cell; of coils and batteries, 1-386-7; as type of electricity, 3-211, 212; of magnet, 5-82.

Positivism. System of philosophy founded by Auguste Comte, which organized all knowledge to form a basis for a science of society and a religion of humanity.

Positron. Sub-atomic particle having the same mass as a negative electron, but carrying an equivalent negative charge. Positrons are emitted by many artificial radio-active elements.

Possessive Adjective, in grammar, 1-19.

Post, Wiley (1900-35). Amer. airman. In 1931 flew round world with H. Gatty in 8 days 15 hrs. 51 mins.; in July 1933, flying solo, did it again in 7 days 18 hrs. 49½ mins.; 1-42.

Postage stamps. See *Stamps* and *Stamp-Collecting*.

Post Bridge, Devon, England, 2-61.

Posthaise. A four-wheeled closed carriage, 6-411.

Poster, in advertising, 1-21 with illus.

Poste restante. A waiting letter service for convenience of travellers, 6-272.

Post-Impressionists in painting, 6-270, 6-34, 3-449; and impressionism, 4-237.

Postmaster-General (P.M.G.) The political chief of the Post Office department of Gt. Britain.

Post Mill. Type of windmill, 7-460, 459 illus.

Post Office, 6-270; first airmail service, 1-85; careers in, 2-238; telegraphy and teleprinter, 7-239, 241 illus.; telephone system, 7-240.

Post Office railway, London, 6-271, 272 illus.

Posture, and hygiene, 4-224 diagr.

Potash or **Potassium Carbonate** 1-111; permanganate of, 1-177.

Potash feldspar, orthoclase feldspar, 3-345.

Potash Soap, 7-80.

Potassium (K). Metallic element of the alkali metal group; atomic no. 19; atomic weight 39.098; melting point 63° C.; 6-273, 3-224; compounds, 1-111, 112; weak radio-activity, 6-352.

Potassium bromide, used in photography, 6-273.

Potassium carbonate. See *Potash*.

Potassium chlorate, commercial uses, 6-273.

Potassium cyanide, 6-273, 6-236.

Potassium nitrate, 6-273; in fireworks, 3-365.

Potato. A vegetable, 6-273, 6-139, 2-24; berries poisonous, 6-236; mechanical digging, 4-79 illus.; starch in, 7-145, 6-182.

Potato blight, effect on Ireland in 19th cent., 6-273.

Potemkin, Prince Grigori Alexandrovich (1739-91). Russ. administrator, diplomat and builder; secret husband of Catherine the Gr., 6-474.

Potential Difference. A difference in the electrical states existing at two points, and which causes a current to flow between them. It is measured by the work done in transferring a unit charge of electricity from one point to the other. **Potential Energy** is the energy which causes a current to flow from a point at higher potential to one at a lower, 3-245.

Potholes, in Derbyshire and Yorkshire, 2-281.

Potholing. Popular sport exploring caves and potholes, 6-118, 4-511.

Potiphar [pot-'far]. An Egypt. official, whose wife tempted Joseph, his slave (Gen. xxxix, 1), 4-383.

Potomac [pot-'mak]. R. of E. U.S.A., flowing 450 m. into Chesapeake Bay.

Potosi [pot-'osi]. Silver and tin-mining city of Bolivia on N. slope of Cerro de Potosi, 47 m. s.w. of Sucre (14,350 ft.); pop. 40,000; 1-507.

Potsdam. Tn. of Pr. Ger., on r. Havel, 18 m. s.w. of Berlin; pop. 73,676; palace of Sans Souci.

Potsdam Conference, July 1945. Held in the Cecilienhof Palace, between Pres. Truman, W. R. Churchill (later succeeded by C. R. Attlee) and J. Stalin, to decide how Germany should be occupied; atomic bomb decision 1-303; 7-142; "Polish boundaries changed, 6-242.

Potsdamerplatz, Berlin, Ger., 1-434 illus.

Potter, Beatrix Helen (1866-1943). Brit. author of children's books, 6-273 2-354.

Potter, Humphrey (18th cent.). Boy who invented method of automatically opening valves of steam engine, 1-327.

Potter, Paul (1825-54). Dutch painter of cattle, 5-384.

Potteries, The. Centre of Eng. china ware and pottery industry in Staffs, 7-141.

Potter's Wheel, and throwing pottery, 6-274, 275 illus.

Potter Wasp. Insect, 4-269 illus.

Pottery and Porcelain, 6-274; invention of, 5-109; types of clay used in, 2-406, 2-375; Chinese, 2-363, 369-372 illus.; anc. Gk., 4-88, 89 illus.; Jap. pottery, 4-351 with illus.; pottery lumps, 4-442; mechanical firing, 2-235 illus.; of anc. Peru, 6-142 illus.; Zapotec, 1-334, 333 illus.

Poultry, 6-277.

Poultry Cross, Salisbury, 6-489 illus.

Pound, Ezra Loomis (b. 1885). Amer. poet and critic, lived in Europe from 1907; (*Canzoni*; *Evocations*; *Cathay*; translations of Japanese and Chinese drama and poetry); a leading exponent of "free verse"; indicted for treason by U.S.A. 1913; captured in Italy 1945; declared mentally unsound in 1946.

Pound (lb.). A unit of weight. See *Weights and Measures*.

Pound. Brit. monetary unit (2^d); in full the pound sterling, 20 shillings; now represented by a Bank of England note; sovereigns are not now in circulation; their gold value is considerably more than £1; 5-235, 2-306; devaluations 3-419; and gold standard, 4-43.

Poundal. The foot-pound-second unit of force. Defined as that force which, acting on a mass of one pound, will impart to it an acceleration of one foot per sec. per sec. The poundal is equal to 1/32 of a force of one pound weight.

Pounds, John (1766-1839). British teacher, philanthropist, and founder of the ragged schools; crippled as a shipwright, he took up shoemaking, and gave free education to poor children; many schools founded in his memory.

Poussin [poos-'n], Nicolas (1594-1665). Fr. painter, originator of Fr. classical style; court painter to Louis XIII

PRAIRIE-DOG

1640-43; 3 439, landscape, 3 113 illus.

Pouter. Variety of pigeon, 6-198.

Powdered Milk, manufacture, 5-206.

Powderball Sprint Handicap, 1-292.

Powder Metallurgy. Process for working metals, also making alloys, without smelting, by compression of metals in powder form at temperatures below their melting point.

Powell, Mary (1825-52). First wife of John Milton, 5-209.

Power, John Wesley (1834-1902). Am. geologist and ethnologist; journey through Grand Canyon (1869), 4 80.

Power, electric, 3-217-220; hydraulic, 4-214; from lightning, 4 506. See also *Energy*.

Power-loom, for weaving; Cartwright's invention, 2-256.

Powers and Roots, in numbers, 5-474.

Power station, in Gt. Brit., 3 217, 218 with illus.

Powys [po-'is], John Cowper (b. 1872). Brit. writer of imaginative fiction, philosophical works, and critical essays; his brothers, Llewelyn (1884-1939) and Theodore Francis (1875-1953), were also authors, 7 100.

Poyning's, Sir Edward (1519-1521). Lord-deputy of Ire.; proclaimed traitor for his part in the rising against Richard III in 1483, he fled to Fr., returning in 1485 with the forces of Henry, Earl of Richmond; he passed the Acts, known as the Statutes of Drogheda, or "Poyning's Law," which provided that no Acts of an Irish Parl. were valid unless first sanctioned by the Eng. privy council.

Poynter, Sir Edward John (1836-1919). Brit. painter of classical subjects. Pres. of Royal Academy, 1896-1919; director of National Gallery, London (1894-1904); 3 273; 'Atlanta's Race', 1 286 illus.

Poznan, Poland (Ger. Posen). Tn. 170 m. S. of Warsaw on r. Warthe; pop. 320,291; important medieval trade centre; held by Prussia 1793-1918; bitter battles in 2nd World War; 6-238.

Pozzuolana. Volcanic ash; in Roman cement, 2-288.

Practical Units. Units in physics and electricity which have been adopted for practical use because the centimetre-grain-second (c.g.s.) units are for many purposes inconveniently large or small. Every practical unit is a decimal multiple or sub-multiple of the corresponding C.G.S. unit, e.g., the ampere is one-tenth of, and the volt is one hundred million times, the corresponding C.G.S. electromagnetic unit.

Prado, The. Famous picture gallery in Madrid, Spain, 5-72, 5-301.

Praetorian [pre-'tor-i-an] Guard. In Rom. history, imperial bodyguard, founded by Augustus, suppressed by Constantine; frequently made and unmade emperors, 6-443 illus.

Praetors. Judges of anc. Rome, 6-430.

Pragmatic Sanction. In Roman law an important public decree. Best-known is that of the Holy Rom. Emp. Charles VI (1713) who, having no sons, tried to secure his lands for Maria Theresa, his daughter, whose succession was disputed in the War of Austrian Succession, 1 326.

Pragmatism. School of philosophy; William James and, 6-159.

Prague. Cap. of Czechoslovakia; pop. 292,284; 6-279, 3-22, 23 illus.; Hradcany Palace, 7-269; battle of, in Seven Years' War (1767), 7-2.

Praha. See *Prague*.

Praia [pr-'ah]. Cap. of Cape Verde Is.; pop. 20,000; 2-218.

Prairie [pr-'er-i]. Tract of level or rolling land destitute of trees and covered with coarse, tall grass, interspersed with varieties of flowering plants; 6-187; in Canada, 1-93, 2-195; wheat-growing, 5-114 with illus.

Prairie-dog. N. Amer. rodent closely related to the squirrel family.

PRAIRIE WOLF

Prairie Wolf, or **Coyote**, of N. Amer., 7-465.
Praseodymium (Pr) [præsoëdīm'ium]. A metallic element of the rare-earth group; atomic no. 59; atomic weight, 140.92; 3-224.
Pratt Truss. In bridge-building, 2-64, 63 diag.
Prawn, compared with shrimp, 7 44.
Praxiteles [praksit'elēz] (fl. 360-340 B.C.). Gk. sculptor, greatest of his age; 4-90; statue of Hermes, 4-85 illus.
Prayer Book in Church of Eng., 6 280, 2-386; Cranmer and 2 526.
Pre-Cambrian Era. In geology, 3 515.
Precentor. Church dignitary, 2 264.
Precession, of gyroscope, 4 113, 112 diag.
Precession of Equinoxes. See **Equinoxes**.
Précieuses Ridicules, Les. Comedy by Molière, 5 232.
Precious Metals. Term usually restricted to gold and silver, but sometimes also including platinum and mercury. See under those metals.
Precious Stones. See **Stones**, **Precious**.
Predestination. Doctrine; Calvin's teaching, 2-179.
Predicate, in grammar, 7-390, 4-55.
Predicator. Instrument used with anti-aircraft artillery to estimate the course and range of hostile aircraft, 1-173, 172 diag.; electronic principle, 3-223.
Prefabrication. Factory production of standardised parts of houses, ships, etc., for erection or assembly on sites; economies labour; 2-117; of fly lines, 6-357 illus.
Preference Shares, 7-159.
Preferred Stocks. See **Stock Exchange Terms** (list).
Prehistoric Animals, 6-281; reptiles, 6-388. See also **Fossils**.
Prelude, The. Poem by Wordsworth, 7 177.
Premier (in Gt. Britain). See **Prime Minister**.
Premium. In insurance, a sum periodically paid by the person insured in order to get a stated sum of money from the society to whom the premium is paid in case of death, fire, etc.; or for life endowment.
Premolars. Teeth, 5-102.
Premontnatensians or **Norbertines**. Order of monks estab. in 1120 by St. Norbert, 5-244.
Premysl Ottokar II. King of Bohemia (reigned 1253-58); extension of Bohemian rule, 1-503.
Preparatory Schools, 6-503.
Proposition, in grammar, 6-283, 4 56.
Pre-Raphaelite Brotherhood, in Eng. art, 6-283, 3-264; Millais and, 5-208; Ruskin and, 6-471.
Presbyterianism, Calvin and, 2-179; attitude to Christmas, 2-382; Laud and, 4-453; in Eng., 3 464; in Scotland, 2 387, 3-463, 464.
Presbyters, church officials; in early Christian church, 2-379.
Prescelly Top. Hill in Pembrokeshire, Wales (1,760 ft.), 6-111.
Prescott, William Hickling (1798-1859). Amer. historian; achieved great results in face of invalidity and partial blindness (*Conquest of Mexico*; *Conquest of Peru*), 7 364.
President. One who presides over a corporation or an assembly; in a republic it is the highest office; the chief officer in a society, univ., or club. See **lists under France**; **United States of America**.
President H. Hoover. Variety of rose, 6-452 illus. f.
Presidium of the U.S.S.R., 6-473.
Pressed Blue Staffordshire, type of brick, 2-58.
Press Gang, 6-285.
Pressure, in physics, 6-185; atmospheric, 7-457, 458; effects on gases, 3-508; in steam engine, 7-152.
Pressure Cooker, 2-498, 1-493, 7-152.
Frestegn [pre'ten']. Co. tn. of Radnorshire, Wales; pop. 1,257; 6-353.
Prester John. King and priest of a mythical land which had no poor, no thieves, no lies, no vices; legends of 13th and 13th cents., Abyssinia associated with, 1-6.

Presto. See **Musical Terms** (list).
Preston. Tn. and port of Lancs, Eng., situated at mouth of r. Ribbles; pop. 119,243; engineering, cotton mfg., exports coal; 3-219, 4-444.
Prestonpans. Tn. in E. Lothian, Scot.; pop. 7,593; victory of Jacobites under Prince Charles Edward over Cope, Sept. 21, 1745; 5-40, 4-335.
Pretender. Name applied to son (Old Pretender) and grandson (Young Pretender) of James II of Gt. Brit., who claimed Brit. throne. See **Charles Edward James Edward**.
Pretoria. Transvaal. Admin. cap. of Union of S. Africa; pop. 283,148; 6 285, 7 88 with illus. f. 7-92.
Prevailing Westerlies. See **Wind**.
Prevention of Cruelty to Animals. Royal Soc. for (R.S.P.C.A.). Formed 1824 by Richard Martin (q.v.).
Prevention of Cruelty to Children. Nat. Soc. for (N.S.P.C.C.). Movement founded by the Rev. B. Waugh, 1881; Royal charter 1895.
Prévost d'Exiles [prīvō' deksēl']. Antoine François (1697-1763) (Abbé Prévost). Fr. monk and novelist (*Manon Lescaut*; "one of the greatest novels of the century").
Priam [prī'am]. In Gk. myth., king of Troy, 1-180, 7 320, 321.
Pribilof Islands, Alaska. Group of isls. in Bering Sea, 1-90.
Price-Thomas, Clement (b. 1893). Brit. surgeon; operated on King George VI, 5-105.
Prickles Learn to Like His Quills. Story of a young porcupine, 6-261.
Prickly Pear. A flat-stemmed cactus and its pear-shaped fruit, 2-157, 161 illus. f.
Pride, Thomas (d. 1658). Parl. officer in Eng. Civil War; in 1648 expelled Royalist and Presbyterian M.P.s from Commons ("Pride's Purge").
Pride and Prejudice. Novel by Jane Austen; published 1813, 1 311.
Prien, Günther. Ger. sailor; sinks *Royal Oak*, 5-319.
Priestley, John Boynton (b. 1894). Brit. novelist and playwright, 6-286.
Priestley, Joseph (1733-1804). Brit. chemist, discoverer of oxygen, 6 287, 6-23; laboratory, 2 316 illus.; and phlogiston theory, 2-317; and rubber, 6-464.

PRINCETON UNIVERSITY

Primary Schools, 6-504.
Primary System (geology). See **Paleozoic Era**.
Primate of All England. The Archbishop of Canterbury, 7-315.
Primate of England. The Archbishop of York.
Primates [prīmā'tōz]. The highest order of mammals, including Man, 5-103, 4-478, 5-101 illus.
Prime, canonical hour of prayer in R.C. Church, 5 244.
Prime factors, in arithmetic, 3-335.
Prime Minister. Head of U.K. govt., 4-50, 6 88; and Cabinet, 2-152. Downing St. residence, 3 109; official country home, 2 327.
Prime numbers, and factors, 3-335.
Priming, in painting, 6-37.
Primo de Rivera, Miguel (1870-1930). Spanish statesman and soldier; in 1923 seized power, setting up a military directorate; introduced in 1925 a civilian administration of which he became premier; 7 109.
Primogeniture. Right of eldest son (Latin, *primus genitus*, first-born) to inheritance.
Primrose. Flower, 6 287; crossing with cowslips, 2-523. section of ovary, 3 395 diag.
Primrose Day, April 19th; Disnach and, 6-288.
Prince, The (II *Princely*), by Michu vell; influence on political thought 5 63.
Prince Albert, Saskatchewan, Canada. Distributing centre for farming region on N. Saskatchewan r.; pop. 17,119. lumber, livestock, and fur interests, packing houses.
Prince Edward Island. Prov. of Canada; area 2,154 sq. m.; pop. 98,429; cap. Charlottetown, 6 288.
Prince of Wales, H.M.S. Battleship of King George V class, displacement, 35,000 tons; sunk by Japs, 7 491.
Prince of Wales Cup. The most coveted yachting trophy in British waters, 7-511.
Prince of Wales. Title first borne by son of Edward I of England, 7 41.
Princeton, New Jersey, U.S.A., built (1776), 1 139.
Princeton University. At Princeton New Jersey, U.S.A., men; non

PRIME MINISTERS OF THE UNITED KINGDOM

1721-42	Sir Robert Walpole	1855-58	Viscount Palmerston
1742-43	Earl of Wilmington	1858-59	Earl of Derby (2nd time)
1743-54	Henry Pelham	1859-65	Viscount Palmerston (2nd time)
1754-56	Duke of Newcastle	1865-66	Earl Russell (2nd time)
1756-57	Duke of Devonshire	1866-68	Earl of Derby (3rd time)
1757-61	Duke of Newcastle (2nd time)	1868	Benjamin Disraeli, aft. Earl of Beaconsfield
1761-63	Earl of Bute	1868-74	W. E. Gladstone
1763-65	George Grenville	1874-80	Earl of Beaconsfield (2nd time)
1765-66	Marquess of Rockingham	1880-85	W. E. Gladstone (2nd time)
1766-69	Earl of Chatham	1885-86	Marquess of Salisbury
1768-70	Duke of Grafton	1886	W. E. Gladstone (3rd time)
1770-82	Lord North, aft. Earl of Guilford	1886-92	Marquess of Salisbury (2nd time)
1782	Marquess of Rockingham (2nd time)	1892-94	W. E. Gladstone (4th time)
1782-83	Earl of Shelburne, aft. Marquess of Lansdowne	1894-95	Earl of Rosebery
1783	Duke of Portland	1895-1902	Marquess of Salisbury (3rd time)
1783-1801	William Pitt	1902-05	Arthur J. Balfour, aft. Earl Balfour
1801-03	Henry Addington, aft. Viscount Sidmouth	1905-03	Sir H. Campbell-Bannerman
1804-06	William Pitt (2nd time)	1908-16	H. H. Asquith, aft. Earl of Oxford and Asquith
1806-07	Lord Grenville	1916-22	David Lloyd George, aft. Earl Lloyd-George
1807-09	Duke of Portland (2nd time)	1922-23	Andrew Bonar Law
1809-12	Spencer Perceval	1923-24	Stanley Baldwin, aft. Earl Baldwin
1812-27	Earl of Liverpool	1924	J. Ramsay MacDonald
1827	George Canning	1924-29	Stanley Baldwin (2nd time)
1827-28	Viscount Goderich, aft. Earl of Ripon	1923-35	J. Ramsay MacDonald (2nd time)
1828-30	Duke of Wellington	1935-37	Stanley Baldwin (3rd time)
1830-34	Earl Grey	1937-40	Neville Chamberlain
1834	Viscount Melbourne	1840-45	Winston S. Churchill
1834-35	Sir Robert Peel	1845-51	Clement R. Attlee
1835-41	Viscount Melbourne (2nd time)	1951-55	Sir Winston S. Churchill
1841-46	Sir Robert Peel (2nd time)	1956-	Sir Anthony Eden
1846-52	Lord John Russell, aft. Earl Russell		
1852	Earl of Derby		
1852-55	Earl of Aberdeen		

PRINCETOWN

sectarian; chartered as College of New Jersey in 1746; arts and science, engineering; 5-398.
Princetown, Dartmoor, Devon, Eng.: prison, 3-82.
Princip, Gavril (1894-1918). Serbian revolutionary; shot Archduke Francis Ferdinand (June 28, 1914) and precipitated 1st World War. 7-478.
Principal Boy, in pantomime, 6-60.
Principality, *The*, another name for Wales, 7-413.
Printing, 6-288; in 16th cent., 2 3 illus.; early printed books, 2 4; Aldus Manutius, 1-97, 98; how a book is made, 2-4, 5; carees in, 2-238; Caxton, 2-283, 284; and handwriting, 7-503; Kelmscott Press, 5-267, 268 illus.; invention of, and libraries, 4 186; "Linotype", 4-516; lithography, 4-522; "Monotype", 5-246; of music, 5 305; how a newspaper is printed, 5 404; process engraving, 6-292; and Renaissance, 6 387; of Shakespeare's plays, 7-14; type and typography, 7-399. *See also Proof Correcting.*

PRINTERS' REFERENCE MARKS

Footnotes are referred to by small numbers or the following signs in order, and then repeated in duplicate.

*	asterisk
†	dagger or obelisk
+	double obelisk
§	section mark
||	parallel mark
¶	blind P or paragraph mark
**	
††	
☛	list

Printing Inks, 4 262.
Prints, Jap. coloured prints, 4-354.
Prior, *Matthew* (1661-1721). Eng. poet and diplomat, best remembered for his light humorous verse; served the govt. long in various capacities; from his share in the negotiations the treaty of Utrecht was popularly labelled "Matt's Peace."
Prior. Head of a priory, or second-in-command to an abbot in a monastery, 5 244 illus.
Priory. Monastic house, 1 2.
Pripet (prip'et). R. in w. Rus.; rises in group of lakes and marshes in White Russia S.S.R.; flows E. and S.E. 100 m. to Dnieper.
Prism. Angular transparent body (usually glass or crystal) used for refracting or dispersing light; function of, 4 198; geometrical volume of, 5 170; Newton's prism, 5-409 illus.; in periscopes, 6-126; in spectroscopy, 7 127, 128 illus. f.; in reflecting telescope, 7-218; in binoculars, 7-250.
Prismatic glass, used in windows, 4-32.
Prismatic lenses, Brewster's work on, 2-56.
Prisons and Punishments, 6 290; habeas corpus and imprisonment, 4 115; among Aztecs, 1-332.
Privateers, compared with pirate ships, 6 206.
Privet. A hardy shrub *Ligustrum*, of olive tribe, very popular for hedges. Several species are common, of which one, *L. vulgare*, is wild in limestone and chalk districts of Brit. Simple green leaves and white sickly-smelling flowers, succeeded by purple-black berries, 6-236.
Privet Hawk moth (*Sphinx ligustri*), 2-143 illus.
Privy Council. Originally the English sovereign's body of advisers, 6-292, and Cabinet development, 2-151.
Prize-fight, in boxing history, 2-29.
Proa. Sailing craft of E. Indies, 1-502, 498 illus.
Probability, in statistics. The likelihood of an event, measured by the ratio of the favourable cases to the

total number of possible cases; probability of drawing a red ball first from a bag containing 3 red balls and 7 white, is 3-10.
Probate, Divorce and Admiralty Division of the High Court, 2-521.
Probation. System by which a prisoner, on the score of youth or for other considerations is given a chance to reform without going to prison.
Proboscidea. Order of mammals including elephants, 5-103.
Proboscis monkey, 5-211, 240 illus.
Processed cheese. Any rindless cheese cooked after it has been made, 2 315.
Process Engraving, 6 292.
Procopius (526-599). Byzantine historian; early mention of silk, 7 61.
Procurator (prok'ur'at) ("the stretch-er"). In Gk. legend, robber slain by Theseus; placed guests on a bed and stretched short men and chopped down tall ones to fit; "bed of Procrustes" is proverbial.
Procurator Fiscal. Scot. legal official: in Scots law, 4 388.
Procyon. Star of the first magnitude, 7-116.
Production. In economics, 3-159.
Production Engineering, careers in, 2-240.
Profit and Loss, in arithmetic, 6-122.
Profits, in economics, 3 160.
Prognosis, in medicine, 5 165.
Progreso. Spl. in Yucatan state, Mexico; pop. 119,990; 5 186.
Prohibition. Term used specially for prohibiting sale of intoxicating liquors in U.S.A. 1919 33, 1 96, 2-335, 7 362; also tried in Iceland, Sweden, Greenland, Finland, and the Indian sub-continent.
Projection, of maps, 5-118 with diagrs.
Projective Geometry, 3 519 with illus.
Projectors, cinema, 2-392.
Prokofief (prok'of'yet). Sergei (1891-1953). Rus. composer; works include *Loves of the Three Oranges* (opera); *Chout* (ballet); "Scythian Suite" (for orchestra). Famous for film music, "Ivan the Terrible," "Alexander Nevsky"; 5 306.
Proletariat (prolet'ariat). In modern usage, working men as a class.
Promenade Concerts (Proms.). Series of orchestral concerts given at Queen's Hall, London, until 1941, then at Albert Hall; instituted in 1895, and conducted until 1944 by Sir Henry Wood; now controlled by B.B.C.
Promethean match. Early type of match, 5 116.
Prometheus. In Gk. myth., one of the Titans who taught men useful arts, and stole fire from heaven for their use, 6 294; and Hercules, 4 166; *Prometheus Bound*, drama by Aeschylus, 1-45.
Promethium (Pm). Chem. element; atomic no. 61; atomic weight 147; 3 224.
Pronoun, in grammar, 6 294, 4 55.
Prontosil, an aniline dye from which sulphur dyes were derived.
Proof Correcting. Method of marking printer's proof. *See* example on next page.
Proof Spirit. Alcohol weighing 14 of an equal measure of distilled water at 15°C.
Propagation, of garden plants, 3-504.
Propeller, in aeroplane, 1-38, 1-32; in "Autogiro," 1-5; in helicopter, 4 157; screw propeller in ships, 7-30.
Propertius, Sextus (c. 49-16 B.C.). Rom. lyric poet, 4-450.
Propets. Hebrew, 6-295.
Proportion, or the "Rule of Three," in arithmetic, 1-238.
Proportional Representation. Electoral system, 3-209.
Propylaea. Gateway or porch to temple etc. in anc. Greece; on Acropolis, 1-13 illus.
Propyl Alcohol, formula, 1-96.
Proscenium, in the theatre, 7-203.
Prose, in the growth of literature, 4-445; Johnson on Addison, 1-16.
Proserpina. *See* Persephone.
Prospecting, and mining, 4-67.
Prospectus. *See* Stock Exchange Terms.

PROVERBS, BOOK OF

Prospero. In Shakespeare's *The Tempest*, banished Duke of Milan, 7-256.
Protoacnium. *See* Protoacnium.
Protageoras (prot'ag'oras) (490-415 B.C.). Gk. philosopher, first to call himself sophist and to teach for payment; taught that "Man is the measure of all things."
Protamine-zinc Insulin. Improved form of insulin for diabetic treatment, 4-270.
Protection, in economics. System of protecting the industries of a country from foreign competition by taxing foreign commodities and granting bounties to home products, 3-12.
Protective Coloration. Among animals and birds, 6 296; among Arctic animals, 1-222; in birds, 1-470, 4 471; in butterflies and moths, 2-136; and camouflage, 2 190; chaameleon, 2-301; among insects, 4-226, 265 illus.; woodcock, 7 467 illus.
Protein Fibres, 6-369.
Proteins, 6-297; as body building substances, 3 409, 410; molecular structure of, 2-321.
Proterozoic Period. In geology, 3-515.
Protestantism. Name for the tenets of that part of the Western Christian Church which does not accept Roman Catholicism; John Knox and Scot. Protestantism, 4 123; Mary's persecution of, 5-140. *See also* Reformation.
Proteus. In Gk. myth., a sea god, son of Poseidon. Had power to foretell the future and when consulted assumed different and terrifying shapes. Those who could keep a hold on him through all changes of form could eventually make him speak.
Proteus, or Cave Newt, 6-297.
Prothallus. A minute self-supporting plant, in reproduction of cryptogams, 6 530, 3 348.
Prothrombin. Element of blood-stream concerned with clotting, 1-190.
Protoacnium (Pa). Chem. element; atomic no. 91; atomic weight 231; 3-224, 6-351.
Prothoradata, in zoological classification, 1-155.
Proton. Positively charged particle having a mass approximately 1,840 times greater than that of the electron and an electrical charge equal but opposite to that of an electron, 1 298; in nuclear fission, 1 300. The number of protons in an atomic nucleus determines the element.
Protoplasm. The living material of all animals and plants, 6 297; and beginnings of life, 3 151; composition, 1 148; in cells, 2-286; and nitrogen, 5 413.
Protozoa. Lowest form of animal life, 6-298, 2 286, 1 154; amoeba, 1-140; instinctive behaviour, 1-151; in disease, 4-14; and malaria, 5-93; parasites on, 6-77; in plankton, 5 496.
Proust (proust'), Marcel (1871-1922). French author; produced in 1913 the first of a series of novels published under the collective title *A la Recherche du Temps Perdu*, and characterised by his discursive style and intimate psychological understanding; 3-456, 5-473.
Prout, Samuel (1783-1852). British painter of landscape and architecture.
Prout, William (1785-1850). British physician and worker in physiological chemistry; suggested that all the elements were compounds of hydrogen; this view ("Prout's hypothesis") stimulated inquiry and some recent discoveries have appeared to confirm it.
Provencal (prova'nsah'). Old Fr. dialect, spoken in Provence, 6-427.
Provenca (prova'ns'). Old prov. ins. E. Fr.; annexed by Fr. 1486; 3-434.
Proverbs, Book of. Twentieth book of the Old Testament, containing a collection of the sayings of the sages of Israel; many ascribed to Solomon.

PROVIDENCE

Providence. Cap. and chief city of Rhode Island, U.S.A., at head of navigation of Providence r.; pop. 247,708; famous for mfr. of jewelry and silverware; 6-392.
Provincetown. Seaside resort, Mass., U.S.A.; pop. 3,745; 5-145 illus.
Prunes. Variety of dried plums, 6-298.
Pruning. in fruit growing, 3-480.
Prussia. Formerly the largest and most powerful state of Ger.; split up into *Länder* in 1948; 6-298; history, 4-8, 3-314, 315; Frederick the Great, 3-462; Seven Years' War, 7-2; partition of Poland 6-240; annexation of Hanover, 4-124; Bismarck and Franco-Prussian War, 3-458.

KINGS OF PRUSSIA AND EMPERORS OF GERMANY

1701-13	Frederick I
1713-40	Frederick William I
1740-86	Frederick II, the Great
1786-97	Frederick William II
1797-1840	Frederick William III
1840-61	Frederick William IV
1861-88	William I (Emperor of Germany from 1871)
1888	Frederick III
1888-1918	William II
(1918)	Republic proclaimed

Prussic Acid, or **Hydrocyanic Acid**, as a poison, 6-236.
Prutah *See* Money (list).
Pruth (próut), **Prut**, or **Prutul**. Trib. of

Danube; 380 m.; after 1945 frontier between Rumania and U.S.S.R.; 6-270.
Pyman, William (1600-69). English Puritan lawyer who became popular here when punished for writing against bishops, etc., by fines, imprisonment, and loss of his ears.
Przemysl (pshem'zil), Poland. Tn. 50 m. w. of Lvov; pop. 51,000; timber and grain trade.
Psalm (sahmzil). The 19th book of the Old Testament; contains 150 psalms about the Exile, New Jerusalem, and the period of David; many attributed to David.
Psaltory. Anc. musical instrument, 5-302, 6-194, 5-309.
Pseudo-sphere, in geometry, 3-519.
Psi, ψ, ψ (ps) Twenty-third letter of Gk. alphabet.
Pallorad. Mt. of Oreta, the ancient Ida; 3,193 ft., 2-527.
Psittacosis. Disease of parrots transmissible to Man and poultry; ban on importation of parrots, 6-92.
Pskov, U.S.S.R. Old city near Estonian border; pop. 59,900, free town and Hansa city in Middle Ages; conquered by Moscow (1510).
Psocoptera. (zool.) Order of insects, including book-lice, in classification of insects, 4-270.
Psyche. *See* Cupid and Psyche.
Psychiatry, 6-299; carriers in, 2-240.
Psychical Research Society for. Founded in 1882 for scientific study of spiritualistic phenomena.
Psycho-analysis, Freud and, 3-469, 6-300

PTOLEMY

Psychological Medicine, 5-145.
Psychology, 6-300; animal behaviour, 7-527; Jung's system of, 4-386; and magic, 5-80; and subconscious memory, 4-168.
Psychrometer, or wet-and-dry-bulb hygrometer, 4-225 with illus.
Ptah. Anc. Egypt. creative deity, patron of artisans, worshipped at Memphis; represented as a shrouded figure holding a sceptre or as a clumsy dwarf, then corresponding to Hephaestus of Gk. myth.; 3-199.
Ptarmigan. Bird, 4-100; foot, 1-471 illus.
Pteranodon, prehistoric animal, 6-281, 282 illus.
Pteridophytes. The fern-like plants as a botanical group, 6-214, 2-24.
Pterodactyl (terodak'til). A prehistoric flying reptile, 6-281.
Pterygota (Zool.). A sub-class of the class *Insecta*; in classification of insects, 4-270.
Ptolemy I, Soter and Lagi (305-285 B.C.). General of Alexander the Great and founder of the line of "Ptolemys," 3-200; and library at Alexandria, 1-101.
Ptolemy II, Philadelphus (308-246 B.C.). Gave chief care to encouragement of commerce and culture, and internal administration of Egypt; built Pharos (lighthouse) of Alexandria.
Ptolemy III, Euergetes ("benefactor") (281-221 B.C.). Ruler of Egypt, invaded Syria and India, and conquered shores of the Hellespont and Thracian coast; under him Ptolemaic Egypt attained greatest

AN EXAMPLE OF PROOF CORRECTING—

↓ now shows signs of dying away. Thomas Hughes famous story of Rugby school contained a generous proportion of preaching but nothing compared with what Rev. F. W. Farrar packed into his two school stories *Eric, or Little by Little* (1858) and *St. Winifred's, or The World of School* (1862). It seems incredible that any boy should ever have waded through such books, perhaps none did. But thousands of parents and uncles and aunts purchased them as presents. Talbot Baines Reed, in such books as *The Fifth Form at St. Dominic's* (1881), *The Master of the Shell* (1887), *The Cock House at Fellsgarth* (1891) and some other robust, jolly school stories, showed that it was possible to convey many a helpful word of advice and warning without being any the less entertaining. A more sophisticated type of story school was developed in the early 20th century by R. S. Warren Bell, P. G. Wodehouse, and others; and the tradition has since been maintained, predominantly by Gunby Hadath, the first of whose many fine school stories was published in 1913.

Stories about girls' schools were never as firmly established in popular favour; but among those few writers who tackled them with success, Angela Brazil (d. 1947) will be remembered as outstanding.

Poetry for children also began by being edifying and instructive rather than enjoyable, if we are to judge from Isaac Watts's collection of *Divine and*

about good and evil
H/
i/
roman
l.c./ being particularly

Above is a reproduction of a printer's "galley" proof showing a portion of one of the articles in THE BOOK OF KNOWLEDGE set in type, together with corrections and other alterations made by the Editor, using the recognized signs to indicate his requirements. A Greek δ written in the margin denotes "delete," i.e. "take out." "Cap." means "capital letter" and "l.c." means "lower case (or small) letter"; "tr" means "transpose" or "put the other way round as shown"; "r.o" means "let the type run on along the same line instead of making a new paragraph"; "N.P." means "start a new paragraph here." The other marks explain themselves. They should be written with a fine pen. On the opposite page is the same passage duly corrected by the printer.

PTOLEMY

ity at home and widest abroad; temple at Karnak, 5-186 illus.

Ptolemy XIII (Auletes) (98-51 B.C.). Father of Cleopatra and Ptolemy XIV, to whom he left the kingdom, 2-407.

Ptolemy XIV (61-47 B.C.). Brother of Cleopatra. Defeated by Julius Caesar on the Nile and drowned in retreating; Cleopatra made queen.

Ptolemy XV (d. 43 B.C.). Last of the Ptolemy, youngest son of Ptolemy XIII; put to death by Cleopatra to make room for her son Caesarion.

Ptolemy (2nd cent. A.D.). Egyptian astronomer and geographer, 6-301; maps, 1-53, 3-514, 5-119; astronomical theories, 1-280; and calculations 2-491.

Ptyalin (t'i'alin). Starch-digesting enzyme of saliva, 3-90.

Publicani. Rom. tax collectors, 6-433.

Public Houses, in Carlisle, 2-242.

Public Library, in Gt. Brit., 4-486, 487.

Public Library Act (1850), and beginnings of public libraries, 4-486.

Public School. Name applied in U.K. to certain independent secondary schools (ages 13-19); origin of name, 6-503; evolution of football, 3-414; stories of public school life, 2-356.

Public Trustee. An Eng. official appointed under the Official Trustee Act of 1906, whose duty it is to see that the funds of trusts put into his care are not lost in speculation or embezzled, as sometimes happens when left to a private trustee; the Act does not apply to Scotland.

—FOR THE PRINTER

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Except for further minor alterations to one line, this is how the passage appears in our "Children's Books" article, Vol. 2. In fairness to our printers it should be made clear that all these errors were deliberately made for the purpose of this explanation. In the normal way so many errors in type-setting would never be made within so small a space.

PURCHASE TAX

Puerta del Sol. Chief square of Madrid, Spain, 5-72, 71 illus.

Puerto Cortez. Honduras. Port on N.W. coast on Gulf of Honduras, pop. 7,000.

Puerto Rico. Isl. of W. Indies, east of Haiti; area 3,423 sq. m., pop. 2,210,703; cap. San Juan; 6-301.

Puff Adder. Deadly snake of Africa, 7-402, 6-388 illus.

Puff Ball, a fungus, 3-488 illus. f.

Puffin. Sea bird, 6-302, 1-309.

Puffing Billy. An early locomotive built, 1813, by Jonathan Foster under William Hedley's patent. Used for hauling trucks to Wylam Colliery. Now in Science Museum, S. Kensington, London.

Puget Sound. Large inlet of Pacific Ocean on N.W. coast of state of Wash., U.S.A.; begins at junction of Straits of Juan de Fuca and Georgia and extends south, 7-123.

Pug-mill. Machine used in brick making, 2-58, 60 illus.

Puleinella. It. original of Punch in Punch-and-Judy show, 6-308.

Pulitzer, Joseph (1847-1911). Amer. journalist and founder of *New York World*; pioneer in use of "human interest" stories. In his will provided for the annual Pulitzer literary prizes.

Pulley. A mechanical device, 6-302, 5-157.

Pullman, George Mortimer (1831-97). Amer. inventor; originator, with Henry Wagner, of the Pullman rly. bar and restaurant car.

Pulmonary Valve, 4-144 with diag.

Pulque. Alcoholic drink made in Mexico from the sap of the agave plant, 1-68.

Pulse. Collective name for leguminous plants (peas, beans, etc.) or their edible seeds.

Pulse, in physiology, 6-304; and heart beat, 4-145; in sleep, 7-67.

Pultusk (pool'tooski), Poland. Mfg. and trading tn. on r. Narow, 30 m. N. of Warsaw; pop. (est.) 20,000.

Charles XII of Sweden defeated Saxons and Poles (1703), and fought Rus. (1808).

Puma, or Mountain Lion 6-304, 5-455 illus.

Pumice. Form of lava, 6-305, 4-456.

Pump, 6-305; diffusion, 7-373; fire-fighting equipment, 3-361; mercury vapour, 7-373; pumping water supply, 7-426, 427.

Pumpernickel. A German bread, 2-52.

Pumpkin. Fruit belonging to same family as vegetable marrow, 6-307, 5-135.

Punans. Primitive people of Borneo, 2-18.

Punch and Judy. A puppet show 6-308, 6-310.

Punched Card Machine, counting by, 2-169.

Punchinello. Variant of Puleinella (q.v.).

Punch Work (embroidery), 3-239.

Punctuation, 6-309, 4-51.

Punic Wars, between Rome and Carthage (264-241 B.C.); (218-201 B.C.); (149-146 B.C.), 2-256, 6-432.

Punjab. Region to the N.W. of the Indian sub-continent. Divided into Punjab (Pakistan) area 63,134 sq. m.; pop. 18,814,000, and P'ujab (India) area 37,428 sq. m.; pop. 12,638,611, 6-310, 4-240, 241, 6-41; annexed by Brit., 4-252.

Punjabi. Dialect of Indian sub-continent, 4-241.

Punkah. A screen fan used in Indian sub-continent, 3-339.

Punta Lamermara. Mt. n. Argentina, 6,016 ft. 6-499.

Pupa or Chrysalis. Stage of life in the metamorphosis of an insect, 4-268, 2-136.

Pupil of eye 3-331.

Puppets 6-310. Punch and Judy 6-308.

Puranas. Hindu writings concerning sacred traditions, 4-250.

Pursell, Henry (c. 1658-95). Eng. musician, 6-311, 5-305; opera, 5-514.

Purchase Tax. Imposed in Oct. 1940 on sale of certain classes of goods in

PURE MATHEMATICS

U.K., to restrict buying of all but necessities; 7-231.
Pure Mathematics, 5-149.
Puri, Summer cap. of Orissa, India, noted for temple of Jugkrnant; 4-240 illus. f.; bazaar, 4-243 illus.
Puritans, 6-311; and Christmas, 2-382; dissenting sects amongst, 2-381; hats worn by, 4-137;
Quakers, 6-316; and Red Indians, 6-372; closure of theatres, 3-119.
Purple Emperor butterfly, 2-739 illus.
Purple Hairstreak butterfly, 2-140 illus.
Purple of Cassius. Colour used in giving ruby or rose tint to glass, pottery, etc.; 4-40.
Purpura. Shell-fish; egg, 3-171 diag.
Purser, in Merchant Navy, 5-172.
Purse Seine, salmon net, 3-380.
Pursuivants. Junior officers of arms; of the College of Arms, 4-165.
Purus. One of chief southern tribes of the Amazon; navigable for 800 m. of its 1,850 m. course.
Pusan or Fusan. Chief pt. of S. Korea, in S.E.; opened to foreign trade 1876; pop. 400,000; 4-428.
Pusey, Edward Bouverie (1800-82). Brit. theologian, leader in Oxford Movement; suspended from preaching for two years for a sermon delivered before Univ. 1843; Pusey House at Oxford named after him.
Pushkin (push'kin), Alexander (1799-1837). Greatest Rus. poet; his gentle humour and keen wit produced some of the best epigrams in any language; originally imitative of Byron, later work original in character and method; 6-480.
Puss moth. Moth whose caterpillar is common on willow and poplar trees; it is green and purplish in colour and front view looks like a cat face; at rear end are two long red filaments which can be protruded when caterpillar is alarmed. Moth, grey and white brindled, emerges from iron-hard cocoon of bark, made by larva, in midsummer.
Pussy Willow. Tree, 7-451.
Puszta. Steppe lands of Hungary, 4-205.
Putney Heath. Open space in S.W. London. Once notable for duelling; 5-28.
Puttling-green, of golf course, 4-16.
Putty. A compound of whiting and linseed oil used by painters and for glazing.
Putumayo. R. of S. Amer., rises in Andes in S.W. Colombia, flows S.E. about 800 m. to Amazon, 1-129.

THE Egyptian picture sign Δ from which our Q is descended represents either an angle or a knee which, of course, forms an angle when bent. In the Egyptian script this sign takes a form Δ which begins to look rather like our Q. The Phoenicians formed it like this Φ and named it *qoph*. Some scholars say this means "ape" and that the character represents an ape with its tail hanging down. Another theory is that it

Qaisoun (ruled 1280-90). Sultan of Egypt; capture of Tripoli (1289), 3-2.
Quadragesima. Latin name for Lent, or the 40 days' fast before Easter. Now denotes 1st Sunday in Lent.
Quadrant. Instrument at one time used for fixing the position of a vessel at sea by taking angles; now superseded by the sextant. Also a type of electrometer invented by Lord Kelvin for measuring small quantities of electricity.
Quadratic Equation, in algebra, 1-106.
Quadrille. Graceful leisured dance. Dancers arranged in squares of four

Puis de Chavannes (pûvê de shavan'), Pierre (1824-98). Fr. painter, restored mural painting to its proper function of decoration (Pantheon, Paris; and in Lyons, Marseilles, Amiens, Rouen Museum); 3-440.
Puy de Dôme. Dept. of France; pop. 479,000; 3-434.
Pu-Yi, Henry (Hsuan-Tung) (b. 1906). Last emperor of China, succeeded 1908; dethroned 1911; temp. restoration 1917; Jap. puppet Emperor of Manchukuo 1934-45; in Russian custody in 1917; 1-272.
Pya. See Money (list).
Pye, Henry James (1745-1813). Brit. poet, succeeded Warton as Poet Laureate; 6-232.
Pygmalion (pig-mā'lon). In Gk legend, a sculptor who fell in love with an ivory image he had made; Aphrodite heard his prayers and granted life to the image, so that Pygmalion might marry her; story, told in Ovid's *Metamorphoses*, used in Gilbert's comedy, *Pygmalion and Galatea*.
Pygmies, 6-312, in Africa, 1-51; compared with dwarfs, 3-110.
Pygoatyle. Tailbone of birds, 1-153.
Pylon. A gateway; in Eg. architecture, one having truncated pyramidal form. In electrical engineering, a steel lattice tower used to support heavy electric cables.
Pylorus. Valve between stomach and duodenum, 3-90 with diag.
Pym, John (1584-1643). Eng. statesman, parl. leader, conspicuous in struggle against Charles I.
Pyongyang. Tn. of N. Korea on Taedong R. Centre of silk industry. Coal mines near by; 4-426.
Pyorrhoea. A disease of the sockets of teeth.
Pyramid, The Great, at Gizeh, Egypt; structure, 6-312, 3-184.
Pyramids. Famous tombs in Egypt, 6-312, 3-184; Eg. art in, 3-193; building, 6-313 illus. f.; volume of, 5-170; stepped pyramid of Zoser, 3-185 illus.
Pyramids. Aztec, 1-332 illus.
Pyramids, Battle of (1798). Victory gained nr. Eg. pyramids by Fr. under Napoleon against the Mamelukes, 5-318.
Pyrenees. Mountain barrier 25 to 90 m. wide and 270 m. long between Fr. and Spain, 6-313, 3-312, 7-104, 3-131; Andorra, 1-149.
Pyrethrum or Feverfew. Several species of chrysanthemum, one wild

QUAKING GRASS

in U.K.; grown as crops in Kenya and Tanganyika for use in insecticides, 2-383.
Pyridine. Derivative of coal-tar, with pungent smell; put into methylated spirits to make it unpalatable, a solvent in rubber and paint industries; relief for asthma.
Pyrites. Iron disulphide, crystalline, brassy-yellow, also called "fool's gold"; crystal, 5-213 illus.
Pyrometer. Instrument for measuring high temperatures. There are four types: platinum resistance, which make use of increased resistance of platinum wire with rise in temperature; thermo-electric, based on the thermocouple (q.c.); optical, based on light intensity of heat; and radiation, based on the degree of radiant heat energy from the hot body, 7-267.
Pyroxenes. Group of silicates, generally of calcium and magnesium, but may also contain iron, aluminium, chromium, manganese, and zinc. Found mainly in igneous rocks.
Pyroxylin. Alternative name for nitrocellulose, used in preparation of collodion, in pharmacy, for making lacquers, and photographic film.
Pyrrhic Victory, origin of phrase, 6-314.
Pyrrhus (c. 318-272 B.C.). King of Epirus. Defeated Romans at Heraclea 280 B.C., 6-314, 6-430.
Pythley (pleh'li). Village in Northants, Eng., famous for hunt, 5-156.
Pythagoras (c. 582-500 B.C.). Gk philosopher and mathematician, 6-314, 6-160; doctrine of number, 5-471; theorem of, 3-517 with diag, 6-381; founded Gk music, 5-302.
Pythagoreans. Followers of Pythagoras; work in maths., 6-315.
Pytheas (4th cent. B.C.). Greek navigator and astronomer. Published works on his journey, of which only fragments remain, 3-511.
Pythia or Pythoness. Priestess of the oracle at Delphi, 3-69.
Pythian Games. In anc. Greece, instituted by Apollo, 1-183, 3-69.
Pythias. See Damon and Pythias.
Python. A group of large non-poisonous snakes, 6-315, 7-74; egg, 3-171 diag; called after mythical serpent slain by Apollo, 1-183.
Pythoness (priestess). See Pythia.
Pyx, Trial of the. Official testing of coinage issued by the Royal Mint dates from time of Henry II examination of coinage, 5-224.



represents an aperture of some kind, the eye of a needle, perhaps—or a human ear. The Phoenicians and Hebrews gave it a sound similar to that of *qaph* (the Phoenician K), but sounded farther back in the throat. The letter Q is not found in classic or modern Greek, for it was dropped (except as a numeral) at a very early date. The Romans kept it and gave it its present form, using it as we do, with *u*, the combination *qu* having the sound of *k*.

couples opposite to and at right angles to each other, 3-37.
Quadruple Alliance (1815) between Gt. Brit., Austria, Prussia, and Russia. Agreed to maintain Treaty of Paris and uphold Vienna settlement; renewed at Aix-la-Chapelle (1818), 1-1.
Quadruplets. Four children born at the same birth.
Quaestors. Officials of anc. Rome; duties, 2-405, 6-430.
Quagga. Species of zebra native to S. Africa, 7-522.
Quaid-i-Azam (great leader). Title given to Mahomed Ali Jinnah, 4-376.

Qual d'Orsay (kādōrsā'). The Foreign Office, so named from the quay on the S. bank of the Seine in Paris where its buildings stand, 6-315.
Quail. Small game bird, 6-316 illus. f.
Quakers, or the Society of Friends, 6-316, 3-464, 2-381; George Fox, 3-426; William Penn and Pennsylvania, 6-117; hats worn by, 4-137.
Quaking Grass, *Briiza media* or *Tonitru grass. A conspicuous grass of the early summer found mainly in the S. and midlands of Brit. Isles; fine silky stems that quiver in the slightest breeze.*

QUALITATIVE ANALYSIS

Qualitative Analysis, in chemistry. The analysis of an unknown substance to find the radicals present.

Quantitative Analysis, in chemistry. The analysis of a mixture to find the percentage of each constituent present.

Quantity Surveying, careers in, 2 210.

Quarantook Hills. Range in Somerset. Eng., 8 m. long; highest point, 1,262 ft.; 3-218, 7-81.

Quantum Theory, 6-317.

Quarantine (from old Fr. word meaning 40 days). Period during which ships suspected of carrying infectious or contagious disease or coming from an infected port are isolated from the shore; any similar isolation (e.g. six months for imported dogs).

Quarles, Francis (1592-1641). Eng. poet who wrote much religious verse, including the well-known *Emblems*.

Quarrying, 6 319.

Quart. British measure of liquid capacity (2 pints). See **Weights and Measures**.

Quarter. A measure of weight, the fourth part of a hundredweight. See **Weights and Measures**.

Quarter Days. Days appointed for payment of house and land rent. In England: Lady day, March 25; midsummer day, June 24; Michaelmas day, Sept. 29; Christmas day, Dec. 25. In Scotland: Feb. 2, May 15, Aug. 1, Nov. 11.

Quartermaster (Q.M.). In Brit. army, an officer responsible for the clothing and feeding of his regiment or battalion; usually holds the rank of lieutenant or captain.

Quartermaster-general (Q.M.G.). Brit. general officer in charge of supply departments of the army; his assistants are A.Q.M.G.

Quatern. Old English measure of capacity (4 pint); a 4-lb. loaf is termed a quatern loaf. See **Weights and Measures**.

Quarters. See **Nautical Terms** (list).

Quarter Sessions, Court of, 2-521.

Quarterstaff. Staff much used as weapon in medieval England, six to eight feet long, shod with iron at both ends; held with both hands, the grip slitting as necessary.

Quartet. In music, a score written for four voices or instruments; also applied to a party of singers or players of that number.

Quarto (1to). See **Paper** (list).

Quartz. Mineral, crystalline form of silicon dioxide, 6 320; crystals, 3 1, 5 213 illus.; in granite, 4 60; and pyro-electricity, 6 196; sand, 6-495.

Quassia [kwosh'a]. Several small tropical trees and shrubs of the *Simarubaceae* family. The white wood of the bitter ash or Jamaica quassia (*Picramnia excelsa*) of South America is used in medicine and as a substitute for hops in beer-making.

Quaternary System. In geology, later part of Cretaceous era, 3 515.

Quatrain, in poetry, 6-234; Fitzgerald's mastery of, 5-511.

Quatre-Bras [katrbrah'l]. VII. 19 m. s.e. of Brussels; indecisive battle between Brit. and Germans under Wellington and French under Ney, on June 16, 1815, 2 days before battle of Waterloo, 7-428.

Quattrocento. It. name for 15th cent.; as period of Italian art, 4-317.

Quebec. Prov. of Canada, area 594,860 sq. m.; pop. 4,055,681; cap. Quebec city; 6-320; foundation, 2-199; name adopted, 2-83; provincial parliament, 2-201.

Quebec. City and cap. of Quebec prov., Canada; pop. 252,890; 6-321, 322 illus., 2 202; cantilever bridge, 2-64; captured (1759) by Brit. under Wolfe, 7-465; Montreal and, 5-249.

Quebec Act. Passed by British Parl. 1774, extending province of Quebec to Ohio and Mississippi rivers, establishing French civil law, and withholding representative institutions; resentment among English colonists was a cause of Revolutionary War.

Quebracho [kãbrah'chô]. S. Amer. tree of the sumach family with

exceedingly hard, heavy wood, yields tannin, 6 76.

Quechua Indians. People of S. Amer., 6-143, 144 illus.

Queen. Title given to a woman sovereign of a state; queen regnant, queen in her own right; queen consort, wife of a king; queen dowager, widow of a king; queen mother, mother of a king or queen.

Queen, chess piece; moves, 2-330.

Queen, of honey bees, 1 106, 405 illus.

Queen, in playing cards; and chess, 2-231.

"Queen Anne's dead" saying; origin, 1-189.

Queen ant, life of, 1-160.

Queen Charlotte Islands (Brit. Solomon Is.). See **Santa Cruz**.

Queen Charlotte Islands (Canada). Part of British Columbia, 100 m. off coast and 135 m. N.W. of Vancouver Is.; 5,100 sq. m.; coal and other minerals; pop. about 2,000, mostly Indians.

Queen Elizabeth. Cunard White-Star liner, 33,673 tons; sister ship to *Queen Mary*; launched in 1938; troopship in 2nd World War, 4-465; maiden voyage as liner in 1946, 7-30, 31 illus., 4 495.

Queen Elizabeth House, Oxford, 6-20.

Queen Mary. Cunard White-Star liner of 81,235 tons; launched in 1931; 1-292, 7-32, 7-40 illus.; at New York, 6-418 illus., 5-171 illus.; used as troopship in war-time, 4 465.

Queen Mary College, London Univ., founded in 1888, 5-33.

Queen Maud Land, Antarctica; scientific expedition (1950), 1 170.

Queen of Spain Fritillary butterfly, 2-140 illus.; egg, 3-171 diag.

Queens. One of the five boroughs of New York City, 5-412, 410.

Queen's Bench. Division of High Court of Justice, 2-521.

Queensberry, John Sholto Douglas, 8th Marquess of (1841-1900). British statesman and sportsman; represented Scotland in Parliament 1872-1880; best known as a patron of boxing; took part in formulating "Queensberry Rules," 2-30.

Queen's Club, London; tennis championships at, 4-161.

Queens' College, Cambridge University, 2 182.

Queen's College, Oxford University, 6 17 illus.

Queen's Counsel, 1 377; in state dress, 4-159 illus.

Queen's Evidence. In Eng. law, a criminal who volunteers to give evidence against his accomplices. He is known as an approver and is said to "turn Queen's evidence."

Queen's Hall, Langham Place, London. Opened in 1893, and long regarded as the chief concert-hall in London; could comfortably accommodate 3,000 people; destroyed in air raid 1911.

Queensland. State of Australia; area 670,500 sq. m.; pop. 1,211,000; 6 322, 1 318.

Queensland, University of. Brisbane, Australia. Founded 1909, 2 71.

Queen's Prize. Annual rifle-shooting competition held at Bisley, Surrey, 7 12.

Queen's Scout badge, 2 33.

Queenstown (Irish Rep.). See **Cobh**.

Queen's University, Belfast, Northern Ireland. Formerly Queen's College (established in 1833, and one of the three colleges in the Royal Univ. of Ireland), it was founded in 1909 when the Royal Univ. was dissolved; arts, science, medicine, law, commerce.

Queen Victoria (1921). Biography by Lytton Strachey, 1-147.

Querétaro [kãrã'tahrô], Mexico. State in centre; 4,432 sq. m.; pop. 244,700; cap. Querétaro.

Querétaro, Mexico. Cap. of state of Querétaro, 110 m. S.W. of Mexico City; pop. 33,600; large cotton mills.

Quern, a handmill, 3-393.

Question Mark, in punctuation, 6 309.

Quetta. An important fortified frontier town, cap. of Baluchistan (Pakistan) at

QUINTILLAN

end of Bolan Pass, pop. 82,000; 1-358; 6-39, 11; earthquake (1935), 3 153.

Quetzal [kotsahl']. A beautiful bright green crested bird, a species of Trogon; tail feathers 2 or 3 ft. long; plumage used as decorations for priests and royalty among Aztecs and Mayas; also part of the national arms of Guatemala.

Quetzal. See **Money** (list).

Quetzalcoatl [kotsãlkôatl]. A heron-god of the Aztecs; represented as author of their civilization; mask, 1 331 illus.

Quezaltenango. Tn. in Guatemala, Cent. Amer., pop. 36,209; 4 101.

Quezon City, Philippines. Now town on N. outskirts of Manila, 5 113, 6-156. Named after Manuel Luis Quezon (1878-1944) first President of Philippines.

Quiberon [këberon']. Historic Fr. tn. on Bay of Quiberon, 22 m. S.E. of Lorient; defeat of French Royalists by Republicans (1795).

Quiberon Bay. Small arm of Bay of Biscay E. of Quiberon; scene of Brit. naval victory under Admiral Hawke over French under Conflans, Nov. 20, 1759, 7 1 illus.

Quicklime. Calcium oxide produced by the burning of limestone and coal in a kiln, 4-508, 2 166, 1-112.

Quicksands, 6-196.

Quicksilver. See **Mercury**.

Quiller-Couch [kôoch], Sir Arthur Thomas, (1863-1944). Brit. writer known under pseudonym of "Q."; prof. of Eng. lit. at Cambridge; edited *Oxford Book of English Verse*; wrote verse, romance, and criticism (notably *On the Art of Writing, On the Art of Reading*).

Quill Pen, 6 111, 112 illus.

Quilter, Roger (1877-1953). Brit. composer. Works include music to the fairy play *Where the Rainbow Ends*; "A Children's Overture"; "Seven Elizabethan Lyrics" and "Three Shakespeare Songs."

Quilting. A form of decorative needlework in which the stitches are worked to make patterns standing in some relief. It is done with an ordinary sewing needle in running stitch or back stitch over a layer of wadding interposed between layers of thin material. When used to decorate down quilts, used for bed coverings, the stitching is usually done by machinery.

Quimper [kampãr']. Cap. of dept. of Finistère, Brittany; pop. 20,200; cathedral, 2 91 illus.

Quince and Medlar. Fruit trees of the apple family, 6 324, 3 181 illus.

Quincentenary (Latin *quinguo*, five, and *centum*, hundred), relating to a period of 500 years, as an anniversary.

Quinine. Extract from cinchona bark used in treatment of malaria, 6 325; source, 3 127; quinine plantation, 2 182 illus.; and malaria, 5 93.

Quinine sulphate, fluorescence, 6 161.

Quinnat. Species of salmon, 6 190.

Quinoline. Colourless oily liquid with faint smell of peppermint, derived from coal-tar, 2 434.

Quinquere. Galley with five banks of oars, rowed by slaves, 5 353.

Quintar. See **Money** (list).

Quintain. Instrument used in Middle Ages for practising tilting on horseback with a lance. Consisted of a post topped by a crossbeam on a pivot, which had at one end a flat board with holes in it. Object of the tilter was to pierce one of the holes with his lance.

Quintero [këntã'rô], Serafin Alvarez (1871-1928), and brother Joaquín (1873-1911). Sp. dramatists; collaborators in brilliant comedies; 7-122.

Quintet, in music, composition for five voices or instruments.

Quintilian (Marcus Fabius Quintilianus). (A.D. c. 35-97). Famous Roman teacher of oratory; wrote *Institutio Oratoria*, a complete treatment of the art of rhetoric, 4-451.




QUINTUPLE TREATY



Quintuple Treaty of 1839, or Treaty of Twenty-four articles. Kingdom of Belgium recognized and its perpetual neutrality guaranteed by Great Britain, France, Prussia, Austria, and Russia, 1-418.
Quintuplets. Five children born at the same birth; notably the Dionnes "quins" born at Callender, Ontario (Canada), in 1934.
Quire. Quantity of paper. *See Paper* (list).
Quirinal (Lat. *Collis Quirinalis*). One of the seven hills of Rome; situated in the N.E. quarter of the city.

Quirites (kwir's'tés). Name applied to citizens of ancient Rome in their civil or domestic capacity. Romans being reserved for military or foreign affairs.
Quisling, Vidkun Abraham (1887-1945). Norwegian traitor. 6-325.
Quito [kétó]. Capital of the Republic of Ecuador in N., about 15 m. S. of the Equator; university; northern cap. of Incas until taken by Spaniards in 1534; 3-161; temperature, 2-410. *See also Earthquake* (list).
Quoich, Loch. Fresh-water loch, Inverness-shire, Scot., 4-275.

Quoin [koin]. In architecture, an external angle of a wall; especially an ashlar or brick corner projecting beyond the general faces of the walls which meet at the angle.
Quois. A game, 6-326.
Quorn, The. Famous Eng. fox hunt, dating from 1698. Name from vill. of Quorn, Leics. 3-428, 427 illus.
Quorum. The number of members of an organized body whose presence is necessary for the legal transaction of business.
Quotation Marks, in punctuation 6-309.

R

OUR letter R is generally traced back to the old Egyptian hieroglyph  representing a mouth. Written in a running hand (the so-called hieratic form) it became . The Phoenicians, writing on stone, gave it a more angular form  and called it *resh*, meaning "head," from its fancied resemblance to the head supported by the neck. The Greeks turned it round and then later rounded it so that it looked just like our P. We should

have had two letters with exactly the same form had they not added a little tail, which made the letter R as we have it to-day. The Romans kept this form, but the Greeks, who had developed the form  for P, dropped the tail again, so their R (*Rho*) is still written . No other consonant shows so many variations in pronunciation. In France and Germany it is rolled. In Great Britain and North America it varies according to the locality

R. Designation of certain Brit. rigid airships, e.g. R.31, R.101; development 1-83, 84 illus.

Raab (rahb) or Győr [gyér], Hungary. Tn. at confluence of Raab and Little Danube rs.; pop. 50,000; machinery, cutlery, oil; agric. trade.

Raabe (rah'bel, Wilhelm (1831-1910). Ger. novelist; eccentric character (*Christoph Pecklin*; *Horacker*); 4-14.

Rabaul. Cap. of Mandated New Guinea until 1934; Japanese base 1942-45. So badly damaged during 2nd World War that it was not rebuilt.

Rabbi. Jewish doctor of the law, 4-375.

Rabbits, 6-327. In Australia, 1-314 illus.; brown as dominant colour, 4-168; imitation ermine fur, 3-496; tail and protective coloration, 6-296.

Rabelais, François (c. 1490-1553). Celebrated Fr. satirist and humorist; his sole work, a medley of wit, wisdom, and coarse buffoonery, recounts the amazing exploits of two giants—Gargantua and Pantagruel, 3-155; satires, 6-387.

Rabies, or Hydrophobia: Pasteur and, 6-95.

Raccoon. Nocturnal carnivorous animal, related to the bears, 6-328; fur, 3-490, 6-155 illus.; *Blackface Meets his Neighbours*, story, 6-329.

Racehorses, 4-197.

Racemic Acid, and polarised light, 7-228.

Races of Mankind, 6-333; African, 1-50; Aryans, 4-251, 6-203; Caucasiforms, 2-271, 6-333, 335 illus.; Celts, 2-288, 6-204; European types, 3-309 illus.; Eskimos, 3-206; in Finland, 3-353; in India, 4-211; Jews, 4-373; Magyars, 6-86; Mongols, 6-237; Negro, 6-362; pygmies, 6-312; Red Indians, 6-371; Slavs, 7-60.

Ra'hil. In Book of Genesis, favourite wife of Jacob, for whom he served 14 years; mother of Joseph and Benjamin.

Rachmaninov (rahmah'ninof), Sergei (1873-1913). Rus. composer and pianist, after Paderewski the greatest of contemporary pianists; composed the popular "Prelude in C Sharp Minor," and numerous other works, 6-306.

Racine, Jean (1639-99). Fr. dramatic poet. 6-334, 3-119, 3-155.

Racine, Wisconsin, U.S.A., industrial city and port on L. Michigan, 50 m. N. of Chicago; pop. 71,190; engineering mfrs; boots and shoes.

Racing: athletics, 1-290; cycle,

3-16; dirt-track, 5-274 illus.; horse-racing, 4-198; motor-cycle, 5-110, 6-275, 274 illus.; swimming, 7-210; yachting, 7-509.

Racing Pigeons, 6-198; racing homer, 6-199 illus.

Rack. Former instrument of torture, an oblong frame of wood on which victim was stretched and his limbs secured by ropes. Ropes then tightened by pulleys to a point at which limbs were dislocated.

Racket, for badminton, 1-346 with illus.; for lawn tennis, 4-160; for tennis, 7-256.

Racket-tailed Humming-bird, 4-203.

Rackham, Arthur (1867-1939). Brit. artist; noted for his delicate and fantastic illustrations to *Peter Pan*, *A Midsummer Night's Dream*, many books of fairy-tales, etc.

Raclawice (rahtslahiv'ke), Battle of. Fought at vill. of Raclawice N. of Cracow 1794; Rus. defeated by Poles under Kosciuszko.

Radar. Transmission of short wave radio impulses and the reception of their echoes, 6-337; bombing by, 1-512; navigation in fog, 5-341; radar tower, 3-98 illus.; wavelength used, 3-221.

Radar-sonde, used with radio-sonde to obtain weather reports, 7-433.

Radcliffe, Ann (1761-1823). Brit. novelist remembered chiefly for *The Mysteries of Udolpho* (1791), an early expression of the Romantic movement.

Radcliffe Observatory. Formerly at Oxford, moved to Pretoria, S. Africa, in 1937, 6-286.

Radiation, 6-339; atomic radiation and physical effects, 1-298, 1-302, 304; in theory of heat, 4-147; lead sulphide ceas., 6-163; quantum theory, 6-317.

Radiator, in motor vehicle, 5-277; copper in, 2-504; prevention of freezing, 7-421.

Radicle or **Radical**. In chem., an element (simple radicle) or group of elements (compound radicle) forming the base of a compound and remaining unaltered during ordinary chem. changes, 2-319.

Radio, 6-340 with illus. f.; first broadcast programmes, 6-345; causers in, 2-236, 238; Marconi's work, 6-122, 123; microphone, 5-193; and popularity of music, 6-306; transmission of photographs, 5-104; radar, 6-337; radio direction-finding station, 6-29 illus.; inside a thermionic valve, 7-378 diag.; transformer,

7-307, 308; speed of radio waves, 6-337, 339, 7-132; wavelength of radio waves, 3-221.

Radio-active Isotopes, iodine and thyroid tumours, 4-276; artificial production and characteristics, 4-301, 302.

Radio-activity, 6-351; and atom 1-297; and ionisation of gas, 4-277.

Radio Astronomy, radio telescope, 5-191 7-250, 251 illus.

Radio City Music-hall, New York world's largest theatre, 5-416.

Radio-cobalt, used in treatment of cancer, 6-352.

Radio Communication, 6-352, Marconi and, 5-123.

Radio Control, of guided missiles, 4-10.

Radio direction-finding, in navigation chart, 5-311, 310 illus.

Radiograph. Image produced on a photographic plate, film or paper by the action of X-rays or gamma rays (*qq.v.*), 7-508 illus.

Radiography, careers in, 2-240.

Radiolaria. Order of unicellular animals with radiating siliceous skeleton, living in marine plankton 6-298; shells in ocean ooze, 1-100 illus.

Radio link, in long-distance telephony, 7-250.

Radio-location. Original name for radar, 6-338.

Radio Officer, in Merchant Navy, 5-172.

Radio receiver: valves, 7-376, 2-144.

Radio stars. Stars in distant outer space which are invisible to telescopes but are detected by the radio waves they emit. Sometimes called black stars, 7-250.

Radio-telegraphy, advantages of, 6-352.

Radio-telephony, 6-352.

Radio telescopes, 7-250, 251, 5-494.

Radio-sonde. Radio transmitter sent up in a balloon to give automatic signals, 5-180, 1-355, 256 illus. 7-433.

Radish. Plant of cabbage family; eaten raw as salad or relish, 2-111 illus.

Rad'ssen Pierre Esprit, Sieur de (1711 cent.). Fr. Canadian explorer and fur trader, 5-222.

Radium (Ra). A radio-active metallic element; atomic no. 88; atomic weight 226.05; 6-352, 1-52, 3-22; discovered by Curies, 3-11; use in medicine, 6-352.

Radium Hill, S. Australia; uranium deposits, 1-320.

Radius. Outer bone of the forearm 1-144 diag.

RADNOR FOREST

Radnor Forest, Wales. Mountainous tract in Radnorshire; highest point, 2,166 ft., 6-353.

Radnorshire. Co. of Wales; area 471 sq. m.; pop. 19,998; co. tn. is Presteigne, 6-353.

Radon (Rn). Chem. element; atomic no. 86; atomic weight 222; 3-224; in air, 1-80, 81; radio-active properties, 6-351.

Ra'dula. Tongue-like rasping structure in snails; means "little file," 7-73.

Rasburn, Sir Henry (1750-1823). Brit. portrait painter, 3-260.

Raeder, Grand Admiral Erich (b. 1876), c.-in-c. German Navy 1935-1943; tried as war criminal, Nuremberg, 1945-46. Imprisoned for life.

Raff, Joseph Joachim (1822-82). Ger. composer; friend of Liszt; produced great number of works, including compositions for piano, violin ("Arlina"), orchestra; operas; chamber music.

Raffles, Sir (T.) Stamford (1781-1826). Brit. administrator; from a clerk in E. India Co., he became Lieut.-Gov. of Java 1811; founded settlement of Singapore 1819, 7-56; naturalist and collector, founding Zoological Soc. in 1826.

Rafflesia. Malayan parasitic plant with horrible odour, 3-401.

Raft. Chinese, 1-502 illus.; rubber air-sea rescue raft, 4-491 illus.

Raft spider, 7-131.

Ragged Robin. Plant growing in damp places, type of campion, 2-191.

Ragnarok. See Twilight of the Gods.

Rags, for paper-making, 6-63, 69, 70 illus.

Ragtime. Name given to an early form of jazz music, 4-357.

Ragusa (Yugoslavia). See Dubrovnik.

Ragwort, *Senecio jacobaea*. One of the commonest British weeds, known for its upright growth and masses of yellow flower-heads; blooms in late summer, often covering large areas. Several species of ragwort spring up profusely on bombed sites of London. Members of family *Compositae*.

Rahere (d. 1111). Founder of St. Bartholomew's Hospital, Smithfield, London. Clerk in holy orders, prebendary of St. Paul's cath. Made pilgrimage to Rome and there contracted malaria; on recovering made vow to build a hospital, and St. Bartholomew in a vision ordered him to build a priory also and chose the site.

Raibolini, Francesco. See Francia.

Raikes, Robert (1735-1811). British philanthropist; founded first Sunday school, 2-425, 6-501.

Rail. See Architectural Terms.

Rail, Coot, and Moorhen. Water birds, 6-353.

Railways, 6-354; in Africa, 1-65; atmospheric railway, 6-231; in Australia, 1-320; banking of tracks and centrifugal force, 2-293; Bradshaw's Railway Guide, 2-38; general careers in, 2-240; career as locomotive engineer, 2-238; fog precautions, 3-405; gauges, 6-356; locomotives, 5-1; model rlys., 5-230; monorail trains, 4-114 with illus.; plastics used in coaches, 6-221 illus.; types of rly. lines, 6-357; rly. workshops, 5-6, 7 illus.; signals, 7-52; Stephenson and, 7-155; trans-Andean systems, 1-148 with illus.; Trevithick's, 7-316; tunnels in Pennines, 6-118; underground rlys., 7-346.

Rainbow, 6-360 with illus. f., 6-361 illus. f.; colours overlap, 7-127.

Rainbow trout, 7-319.

Rainfall, 6-360; and climate, 2-409; influence of oceans, 3-150; world rainfall map, 6-361; forms as snow, 7-77

Rain Gauge, instrument for measuring rainfall, 6-361.

Rainier or Tacoma, Mt. Glacier-capped volcano in Cascade Range, Wash., U.S.A., 50 m. s.e. of Tacoma; 14,408 ft. Here is a national park, area 377 sq. m., 7-423, 7-357 illus., 5-452.

Rain-makers, and superstition, 5-77.

Raisins. Small dried grapes, 6-361.

Rajasthan. State of Rep. of India; area 128,424 sq. m.; pop. 15,297,979; cap. Jaipur, 4-241.

Rajasthan. District of India, 4-241.

Rajkot. Cap. of Saurashtra state, Rep. of India, 4-241.

Raj Pramukh. (Skt. ruling chief). Title of constitutional head, equivalent of Governor, of a state or union of states within the Union of India; 4-240.

Rajputana. Geographical name for area of India occupying northern part of Rajasthan.

Rajputs. People of India; tradition of art, 4-249.

Raleigh, Sir Walter (c. 1552-1618). Eng. politician, soldier, sailor, explorer, poet, and historian, 6-362; expeditions to N. Amer., 1-135; exploration of Carolina coast, 2-242; on Orinoco r., 6-3; and tobacco, 7-286; Marlowe, 5-133; in Tower of London, 7-303.

Raleigh, Sir Walter Alexander (1861-1922). Brit. man of letters; professor of Eng. literature at universities of Liverpool, Glasgow, and Oxford.

Raleigh, North Carolina, U.S.A. Cap. of state; pop. 65,680; important cotton and tobacco market; 2-245.

Ram. Offensive weapon on warships until mid-19th century; on ancient galleys, 5-353.

Ram (Aries). One of the 12 signs of the zodiac, 7-524 illus.

Ram. A male sheep, 7-20.

Rama (rah'ma). In Hindu myth., one of incarnations of the god Vishnu, hero of great Hindu epic Ramayana.

Ramadan (ramadan). Ninth month of Muhamedan year, kept as strict fast among Muhamedans, 5-89.

Ramayana (rah'ma'yana). Hindu epic, describing adventures of Rama, an incarnation of Vishnu, 4-241.

Rambler. Journal founded by Samuel Johnson; compared with *Spectator*, 1-16.

Rambouillet (rah'mbwéyá). Catherine de Vivonne, Marquise de (1588-1665). Founder of first great Fr. literary salon (satirised by Molière in *Les Précieuses Ridicules*).

Ramée, Louise de la. Brit. novelist who used the pen-name of Ouida (q.v.).

Ramesses II, the Great. King of Egypt (13th cent. B.C.), famous as a builder some of his temples still remain; 3-200; and Cleopatra's Needle, 2-408; colossi at Abu Simbel, 3-191 illus.; temple statues, 3-167 illus.

Rameses III. King of Egypt (12th cent. B.C.); founded 20th dynasty; famed for his military exploits; remarkable tomb at Thebes.

Ramie or China Grass. Fibre of Asiatic plant belonging to nettle family; paper made from, 6-63.

Ramillies. A village in central Belgium 28 m. s.e. of Brussels where Marlborough defeated French (1706) in Seven Years' War, 5-132.

Ram Lilla. Hindu religious play, 4-241 illus. f.

Ramon, Gaston (b. 1886). Fr. bacteriologist; his vaccination serum giving immunity against diphtheria and tetanus in one injection widely used.

Ramoth-Gilead. In Biblical times, city in Palestine E. of r. Jordan.

Ramsay, Allan (1796-1758). Scot. pastoral poet and publisher, best remembered for his *Gentle Shepherd*, 6-614; his son Allan (1713-84) was a successful portrait painter whom George III patronised, 3-259 with illus.

Ramsay, Sir William (1852-1916). Brit. chemist. Discovered argon and helium, and (in conjunction with Rayleigh and M. W. Travers) the gases krypton, neon, and xenon; 6-363, 4-160, 7-127.

Ramsey. Tn. on Isle of Man; pop. 4,607; 5-110.

Ramsgate. Spt. and holiday resort of Kent, Eng. Extensive sandy beach; fisheries and shipbuilding trades. Pop. 35,748; 4-398.

Ram's-horn Trumpet. Jewish musical instrument, 6-302.

RASMUSSEN

Ramsens (plant). See Garlic.

Ramsted (plant). See Toadflax.

Rand (Transvaal). See Witwatersrand.

Randers. Tn. in S. Jutland, Denmark; pop. 36,131; glass and other mfrs.; exports grain, dairy products wool; 3-72.

Ranelagh Gardens. Former London place of amusement E. of Chelsea Hospital, and now part of gardens of that institution. Laid out 1690-91, and from 1742 to 1803 they were a rival to Vauxhall Gardens; circus entertainments, 2-404.

Range-finder. In artillery, an instrument for finding the range of, or distance to, the target before opening fire with guns or small arms; anti-aircraft artillery, 1-172 diag. In surveying, an instrument to fix points to be in the same straight line; of camera, 6-181.

Rangers. Branch of Girl Guides, 4-24.

Rangers. Glasgow football club, 4-20.

Rangoon. Cap. of Burma; pop. 500,800; 6-363, 2-130; captured by Brit., May 1915, 7-498.

Ranjitsinhji (ranjitsin'ji). Kumar Shri ("Ranji") (1872-1933). Indian prince and cricketer; Cambridge blue, played for Sussex, 1895-1914, and for Eng. v. Australia, 1896-1902; one of most brilliant batsmen ever known.

Ranke (ran'kel), Leopold von (1795-1886). Ger. historian, founder of modern critical methods of historical study.

Rannoch. Loch, Perthshire, Scot.; length 9 m., width 1 m., 6-138.

Ransome, Arthur (b. 1881). British writer for children; works include *A History of Story-Telling*; *Old Peter's Russian Tales*; *Swallows and Amazons*; *Peter Duck*; *Secret Water*; *Great Northern*; 2-354.

Ranunculaceae (ranunkul'asé). The buttercup family containing, besides the buttercups, the delphiniums, anemones, clematis, columbine, and many other common wild and cultivated plants; peony, 6-120.

Rapallo (rapal'lo). It. Small winter resort on bay of Genoa, 16 m. E. of Genoa; treaties between It. and Yugoslavia (1920) and Ger. and Rus. (1922), signed here.

Rapallo, Treaty of. between It. and Yugoslavia (1920) settling disputed Adriatic territory. Another (1922) between Germany and Russia annulled the treaty of Brest-Litovsk and cancelled mutual indemnity claims and pre-war debts.

Rape of the Lock, The (1712). Mock heroic poem by Alexander Pope, 6-259.

Raphael. An archangel; in Milton's *Paradise Lost*, 5-211.

Raphael (Raffaello Sanzi, 1483-1520). It. painter; 6-363, 4-320; Raphael's engravings, 3-292; Madonna and Child, 4-321 illus.; Madonna of the Chair, 5-69, 68 illus.; Noah building the Ark, 5-445 illus.; Pope Leo X, 6-385 illus.; St. George and the Dragon, 3-520 illus.

Rappahan'nock. R. of Virginia, U.S.A., source in Blue Ridge Mts.; flows S.E. to Chesapeake Bay.

Rappen. See Money (list).

Rare Earths or Lanthanides. A group of closely related metallic elements in the aluminium group; numbered 57-71; atomic weights 138.9 up to 174.99 inclusive; found together in minute quantities in several minerals; a list is given at foot of table in 3-224; 7-259.

Ras Hafun. Easternmost point of Africa; 1-49.

Rasheed Ali (b. 1889). Iraqi politician; prime min. to Feisal I in 1933 and again in 1940; by a coup established himself April 3, 1941, as premier of Iraq, supporting the Axis; fled to Persia after month's fighting with Brit. troops, then to Berlin; recaptured by Ibn Saud in Saudi Arabia after 2nd World War.

Rasmussen, Knud (1878-1933). Danish Arctic explorer, b. in Greenland; made five important expeditions to

RASPBERRY

Greenland, including a remarkable trip across the island, 1912-14. In 1922 he discovered relics of the Franklin expedition.

Raspberry. A fruit, 6-364; fruit and blossom, 3-481 illus.

Raspudin (raspudlin), Gregory Efmovitch (1871-1916). Rus. fanatic; uncouth peasant who deserted family for religious life in 1901; gained vast influence through fanatical teachings and personal magnetism; interference in politics led to his murder by Rus. nobles; influence on Tzarina, 5-432.

Rasam, Hormuzd (1826-1910). Turk. archaeologist; work at Nineveh, 5-442.

Rastatt. Tn. in *Land of Baden-Württemberg*, 8. Ger.; pop. 14,000; Franco-Austrian treaty (1711) ending War of Sp. Succession.

Raster. In television, 7-251, 252.

Rat. Rodent (family *Muridae*), 6-365.

Ratafia [ratat'ia]. Name for cordials or liqueurs made from, and flavoured with, cherries, almonds, apricots, or plums. Crushed kernels as well as flesh of fruit are steeped in spirit, which is afterwards distilled.

Rates. In the U.K., local taxes on occupiers of property levied by local authority, 7-231, 4-52.

Rationalists. School of philosophers, 6-159.

Rationing. Restrictions on the purchase of food and other goods because of shortages or emergency, particularly in war-time. Germany adopted food rationing 1915, during 1st World War. In force in Great Britain 1917-1920, when sugar, meat, fats rationed. In 2nd World War began Jan. 1940, with butter, bacon, sugar. Meat, groceries, sweets, rationed later. Clothes rationed 1941-1949, soap, 1942-1950, petrol 1939-1950 (no private motoring 1942-1945). End of rationing in Britain July 1954.

Ratisbon. See *Regensburg*.

Ratlines. See *Nautical Terms* (list).

Rat of Black and Tan Terrier. See *Dogs* (list).

Rattan Palm. Variety of palm, 6-50.

Rattigan, Terence Mervyn (b. 1911). Brit. dramatist; among his many plays are *French Without Tears*, *Flare Path*, *While the Sun Shines*, *The Winslow Boy*, *The Browning Version*, *The Deep Blue Sea*.

Rattlesnake. Venomous snake native to Amer.; about 20 species, 6-366, 7-75, 7-402.

Ravel (ravol'), Maurice Joseph (1875-1937). Fr. composer. Works include *L'Heure Espagnole* (comic opera); *Daphnis et Chloé* (ballet); "Bolero" (orchestral); piano concerto; 5-306.

Raven (*Corvus corax*), a bird of the crow family, 6-366.

Ravenna. City of It., cap. of Ravenna prov.; pop. 85,451; 6-367; Roman mosaic, 4-317.

Ravenna, Battle of. Victory of Fr. over united Sp. and papal armies in 1512; use of artillery, 6-368.

Ravenna, Exarchate of. Territory ruled by Byzantine exarch or governor in It. 6th-8th cents.; cap. Ravenna; 4-306.

Ravensbrück. Notorious Nazi concentration camp for women, nr. Berlin; 11 camp attendants sentenced to be hanged, Feb. 1947, for murders and cruelties.

Ravenscroft, George (1618-81). London merchant and glass-maker; and flint glass, 4-30.

Ravi, r. of Punjab, boundary in part between India and Pakistan; 450 m.; passes Lahore and joins Chenab 35 m. N. of Multan; 4-259, 6-44, 6-310.

Ravillous, Eric (1903-42). Brit. artist; illustrated books and made reputation with designs for pottery and glass. Official Admiralty war artist; lost in 1942 while flying from Iceland; 3-263.

Rawalpindi. Tn. in w. Pakistan; pop. 243,000; 6-39, 44; bazaar, 6-43 illus.

RED HERRING

Rawalpindi, S.S. Brit. armed merchant cruiser; sunk by Ger. battleship *Scharnhorst*, Nov. 23, 1939, in first important naval engagement of 2nd World War, 5-350.

Rawlinson, Sir Henry Creswicke (1810-95). Brit. soldier, diplomat, and Orientalist; first successful decipherer of Persian cuneiform inscriptions; discovered Behistun rock recording triumphs of Darius the Great, in Persian, Babylonian, and Sasan, 6-130 illus.

Rawsthorne, Alan (b. 1905). Brit. composer; variations for two violins; symphonic studies; concerto for piano, another for violin; songs.

Ray (fish). See *Skate*.

Rayleigh, John William Strutt, Baron (1842-1919). Brit. physicist; 1901 Nobel prizewinner; and radiation, 6-318.

Raymond of Toulouse (d. 1105). Powerful count of Provence; a leader in 1st Crusade, 3-1.

Rayon and Synthetic Fibres. 6-368.

Rays; radio-activity, 6-351. See also *Ultra-Violet Rays*; *X-Rays*.

Razin, Stenka (d. 1671). Cossack adventurer who ruled a large area of Russia in 17th cent., 6-471.

Razorbill. Bird of the auk family, in Brit. Isls., 1-309.

Razors, obsidian used, 1-397.

Ré (râ). Fr. isl. in Bay of Biscay, 33 sq. m.; mainly sand dunes; salt, oysters.

Reactance. The characteristic of the impedance (resistance) to the flow of an alternating electric current in a circuit. It is governed by the inductance or capacitance in the circuit, 3-216.

Reaction Motor. See *Jet Engine*.

Reade, Charles (1811-81). Brit. novelist and reformer; *It's Never Too Late to Mend*, directed at prison abuses; *Foul Play*, an attack on overloading and over-insuring of ships; *The Cloister and the Hearth*, 6-386; 3-291, 5-172.

Reading (red'ing), Rufus Isaacs, 1st Marquess of (1860-1935). Brit. jurist, first Jewish Lord Chief Justice of Eng. (1913-21); special ambassador to U.S.A. (1918); Viceroy of India (1921-26); sec. for foreign affairs in National govt. (1931); lord warden of the Cinque Ports (1934).

Reading. Co. tn. of Berkshire, 36 m. W. of London, on r. Kennet, near junction with Thames; pop. 114,176; agricultural centre, esp. noted for sewing; has printing, engineering, and biscuit factories; Univ. founded 1926; 1-132.

Reading, Pennsylvania, U.S.A. Mfg. city 50 m. N.W. of Philadelphia; pop. 109,320; mfrs. iron and steel-ware, etc.

Ready-reckoners; use in calculation, 1-237.

Realism, in drama, 3-121; in the novel, 5-472.

Real Property. In Eng. law, lands, houses, and other immovable things as contrasted with personal property consisting of movable things.

Ream. Quantity of paper. Consists of 480 sheets or 20 quires. The perfect, long, or printer's ream has 516 sheets.

Rear-admiral. Naval rank below vice-admiral; insignia and flag; 1-20 illus., 5-354 illus.

Réaumur (rëomür'), René Antoine de (1683-1757). Fr. physicist and naturalist; showed corals to be animals, not plants; discovered method of tinning iron; Réaumur temperature scale, 7-268, 267 illus.

Rebate, or Rabbit. See *Architectural Terms*.

Rebec. Anc. musical instrument, ancestor of the violin, 5-309.

Rebecca. A Biblical character; wife of Isaac and mother of Esau and Jacob (Gen. xiv.).

Réaumur (rëkam'yü), Madame Julie (1777-1849). Fr. society leader, famed for beauty and intelligence; friend of Chateaubriand and Madame de Staël; opponent of Napoleon; portrait by David, 3-444 illus.

Receiver, radar, 6-338; radio, 6-340 illus. f.

Recent Period. In geology, 3-515, 516.

Recessive Characteristics, in heredity, 4-168, 5-169.

Recife. Spt., mfg. centre, and cap. of state of Pernambuco, Brazil, on Atlantic coast at easternmost point of S. Amer.; pop. 534,000; 2-48.

Recitative. See *Musical Terms* (list).

Reclus (raklû), Jean Jacques Éliée (1830-1905). Fr. geographer; remarkable scientific knowledge and literary style (*The Earth and Its Inhabitants*).

Recoil, of guns; and rocket propulsion, 6-421.

Reconnaissance Corps (Recco). Unit of Brit. army, formed 1941 and trained on commando lines; one battn. with mechanised transport attached to each infantry div. to reconnoitre; corps absorbed in R.A.C., Jun. 1944.

Record, Gramophone; principles and manufacture, 4-57, 58, 59.

Record-changer, on gramophone, how it works, 4-59 with illus.

Recorder. Legal official of city or borough, 2-521.

Recorder. Musical instrument, 5-309 and Dolmetsch family, 5-308 illus.

Recordings, of radio programmes, 6-319.

Record-keeping, careers and opportunities, 2-228.

Record Office. Building situated between Fetter Lane and Chancery Lane, London, in which are preserved state papers, etc., among them Domesday book, numerous royal charters, and other historic documents.

Rectangle, in geometry; area of, 5-170.

Rectangular Solid, in geometry; volume of, 5-170.

Rectified Spirit, 1-96.

Rectifier. In electrical engineering a device for converting an alternating current into a direct current. It consists of an arrangement of conductors which offer a much higher resistance to an electric current flowing in one direction than in the other.

Rector. In the C. of E., incumbent of a benefice who enjoys all the titles as distinct from a vicar, who draws only a part; 2-386. The term is used in the U.S.A. for any incumbent of a parish in the Protestant Episcopal Church, and it is also an elective office at Scottish universities.

Rectum. In anatomy; and digestive system, 3-90.

Red, a primary colour of pigment, 6-38; in signals, 7-52.

Red Admiral butterfly, 2-139 illus.

Red-backed Shrike. Bird, 7-41; egg, 1-452 illus. f.; migration, 5-204 illus. f.

Red Bird of Paradise, 6-76.

Red-breasted Merganser, a diving duck with long, hooked beak adapted to gripping fish.

Red-cap Amanita, or Fly Mushroom 3-488 illus. f.

Redcar. Seaside resort of N. York-Eng., near mouth of r. Tees. Magnificent sandy beach. Pop. 27,512.

Red Carneau, pigeon, 6-199 illus.

Red Cedar. See *Virginia Juniper*.

Red Clavaria, a fungus, 3-488 illus. f.

Red Clover, and humble bees, 1-40, 2-423.

Red Crescent. Emblem used by Turkey corresponding to the Red Cross.

Red Cross Societies, 6-370; foundation 3-512.

Red Currants, fruit and blossom, 3-48 illus.

Red Deer (*Cervus elaphus*), 3-60.

Redditch. Market tn. of Worces, Eng. 13 m. S. of Birmingham. Mfrs. include motor and aeroplane parts, needles, pins, fishing tackle, electric batteries. Pop. 29,184.

Red English Pouter, pigeon, 6-199 illus.

Red Ensign. Flag of British Merchant Navy, 3-385, 384 illus. f.

Red Grouse, Bird; egg, 1-452 illus. f.

Red Herring, how prepared, 4-171.

REDIFFUSION

Reddiffusion, of radio programmes, 6-348.

Red Indians. Native aborigines of N. Amer., 6-371; name given by early explorers, 1-136; in Alaska, 1-221; in Arizona, 1-238; basket-work, 1-379; in Canada, 2-197; canoe, 1-499 illus.; fish used as lamps, 4-142; food and clothing from bison, 1-175; hunting and magic, 5-77; origin of lacrosse, 4-435; as a Mongoliform, 6-335 illus.

Red Ink, 4-261; and fluorescence, 6-161.

Red Kangaroo, 4-392.

Red Lead. Minium; an ingredient of mineral paint, 6-37, 4-463.

Red-legged Partridge, 6-94.

Red-letter Day. Literally, a holy day or saint's day marked in early Church calendars in red ink. Judges of Queen's Bench Division wear scarlet robes on such days.

Redmond, John Edward (1851-1918). Irish parl. leader who secured passage of Home Rule bill of 1914, though it did not come into operation until after his death.

Red-necked Grebe. Bird, 4-69.

Red Peppers, variety of pepper, 6-121.

Redpoll. Bird of finch family, native to Asia, N. America, Europe. Length, 1 in. Reddish brown above; crimson forehead; rose-pink breast; white below. In habits and song resembles the linnet.

Red River. The southernmost of the great tributaries of the Mississippi, U.S.A., rises in Staked Plains of Texas; 1,200 m. long.

Red River. R. of N. America. Rises near source of Mississippi in Minnesota, and flows finally N. into Lake Winnipeg in Manitoba, 300 m. long, 5-111. In flood time enables vessels to pass from Hudson Bay to Gulf of Mexico.

Red River Settlement. Former colony of Canada, now part of Manitoba. Founded 1811 by Earl of Selkirk. In 1870 half-breeds in district rose against Canadian govt., as protest against annexation, but suppressed by Can. and Brit. force under Sir G. Wolsey; 5-115.

Red Sea. Arm of Indian Ocean between Arabia and N.E. Africa, 6-375; origin of colour, 6-211.

Redshank. Wading shore bird, *Tringa totanus*, native to Africa, Asia, Europe, and E. England, 7-408 with illus.

Red Soldier. A cider apple, 1-186 illus. f.

Red Square, Moscow, 5-268; 270 illus.

Red Squirrel. Species native to Brit., 7-110 with illus.

Redstart. Bird, relative of the robin, summer visitor to Gt. Brit. Distinguished by its brilliant chestnut-red patch at base of the tail; rest of plumage is white (on head) and slate-covered (back); 5-204 illus. f.

Reductio ad Absurdum (Lat.). Method of proof, which begins by assuming that what has to be proved is wrong, and then shows that this assumption results in an absurdity. It follows, therefore, that the original proposition was not wrong, but right.

Reduction. In chemistry, any reaction which removes oxygen (or some other electro-negative atom or group) from a molecule, or alternatively adds hydrogen (or some other) electro-positive atom or group.

Red Underwing moth, 2-144 illus.; protective coloration, 6-296 illus. f.

Redwing. Bird native to Europe, winter visitor to Gt. Brit. Related to song thrush which it resembles. Chestnut red on sides; 7-271; migration, 5-304 illus. f.

Redwood Tree. See *Wellingtonia*.

Ree, Lough, Irish Rep. Lake traversed by R. Shannon; 18 m. long, from 1 in. to 7 m. broad; 7-16.

Reed, Ezekiel (18th cent.). Amer. inventor; first nail-making machine, 5-313.

Reed, Talbot Baines (1852-93). Brit. author of school stories for boys, 2-356.

Reed, Walter (1851-1902). Amer. army surgeon and bacteriologist; discovered cause of yellow fever, 5-165.

Reed. See *Weights and Measures*.

Reed-bunting. Bird living in fens and marshes, 2-125.

Reed Instruments, in music, 5-307.

Reed Mace. Marsh plant commonly called bulrush, 2-123 illus.

Reed Pen, 6-111, 112 illus.

Reed Warbler. Bird, 7-419; nest, 1-459 illus.; migration, 5-201 illus. f.

Reef. See *Nautical Terms* (list).

Reef Knot, uses and how to tie, 4-121.

Reel. Scot. nat. dance, performed by two or more couples and called accordingly a foursome, sixsome or eightsome reel. Music provided by bagpipes or fiddle.

Rees, Dal (b. 1913). British golfer; winner of numerous events in Gt. Brit., 4-41.

Refectory, of monastery, 5-211.

Referendum. Direct public "yes" or "no" vote on a measure proposed by a legislative body; system most highly developed in Switzerland; also used in Australia and some states of the U.S.A.

Reflecting Telescope, 7-218.

Reflection, of light, 4-198, 199.

Reflex Actions, and cerebellum, 2-40; and learning by heart, 3-166.

Reflex Camera, 6-172.

Reform Act, of 1832, 6-88, 7-407, 7-453; of 1867, 2-69.

Reformation, The, 6-376; Calvin and 2-178; Henry VIII and, 3-277; Luther and, 5-53; Protestant martyrs, 5-139; religious leaders, 2-380, 381; strife in Fr., 3-150; and R.C. Church, 6-426; in Switz., 7-328; Tyndale's influence, 7-339; Wycliffe's influence, 7-305.

Reformatory School. Former name of institution for young offenders, now called "approved" school (q.v.).

Refracting Telescope, 7-218.

Refraction, of light, 4-198, 199.

Refractive Index. Ratio of the sine of the angle of incidence to the sine of the angle of refraction when a light ray passes from one medium to another. Often confused with refractivity (q.v.).

Refractivity. Refractive index (q.v.) for the passage of light from a vacuum into any given medium (e.g. glass).

Refrigeration, and antiseptics, 1-177; of fish, 3-382; freezing ground for mine shafts, 2-430; salt in, 6-140.

Refrigerator, 6-378; action of ammonia, 1-140; mercury used in, 5-174.

Regalia. See *Crown Jewels*.

Regal Lily. Type of lily, 4-507 illus.

Regan. Daughter of King Lear in the tragedy by Shakespeare, 4-109.

Regency Architecture, in England; 1-217, 218; Brighton, 2-70 illus.; Bristol, 2-72 illus.

Regeneration of Lost Parts. The renewal or replacement of parts or organs of living animals; lizards and their tails, 4-528.

Regensburg or Ratisbon. Ger. commercial and mkr. tn. in Bavaria on Danube; pop. 83,580; stormed by Napoleon in 1809; once free Imperial city; 4-1.

Regent. Person acting for a sovereign who is absent or otherwise incapable of ruling.

Regent or Pitt Diamond, 3-85, 82 illus.

Regent's Canal. London waterway joining the Grand Union canal; constructed 1812-20 by Nash and named after George IV when Prince Regent, 2-206 illus.

Regent's Park, London. An area of 470 acres in N.W. London, originally laid out as grounds of suggested palace during Regency of King George IV; contains the Zoological Gardens and Bedford Coll. for Women; Open-Air Theatre, 6-201, 1-285 illus.

Regent Street, London. A famous mile-long street laid out by John Nash in 1813-20 to connect the Prince Regent's (George IV) residence with Regent's Park; rebuilt in 1920s.

REINHARDT

Reggio di Calabria [rej'ôdîkalah'brîa]. Spt. of s. It. on Strait of Messina; pop. 136,580; silk, perfume, olive-oil; earthquakes in 1783 and 1908; ancient Gk city, Regium; Allied landing, Sept., 1943, 7-453.

Reggio nell' Emilia. Commercial and mfr. city of s. It., on branch of r. Po; pop. 105,600; cathedral.

Regicides [rej'sidz]. In Eng. history those persons directly responsible for execution of Charles I.; especially the 67 members of High Court of Justice who voted for the death penalty.

Regillus. Anc. lake nr. Rome, now disappeared; battle at (496 B.C.), 6-129, 2-201.

Regiment. In Brit. army the largest permanent unit; in the infantry usually consists of two battalions, in the cavalry (now mechanised) of four squadrons. In foreign armies a regiment normally has three battalions; regimental colours, 2-465.

Regin [rû'yn]. In Norse and Ger. myth., dwarf smith who rears Sigmund.

Regina. Cap. of Saskatchewan, Canada. In wheat-growing area. Mfrs. include agricultural implements, motor vehicles, bricks. Pop. 71,319; 2-195, 6-500.

Registrar-General. Official superintending the registration of births, marriages and deaths in Eng. and Wales; hq. at Somerset House, London; and census returns, 2-291.

Regnum. Rom. name for Chichester, Sussex.

Regulus. Star of the first magnitude, 7-116.

Rehoboam (c. 953-937 B.C.). King of Israel, son of Solomon; his treatment of the tribes led to the revolt of all except Judah and Benjamin, 4-371.

Reich. Ger. word for empire or realm; the name Deutsches Reich was applied to Germany, and the govt. during the Nazi régime (1933-45) was known as the Third Reich.

Reichenbach [rîkh'emahkh]. Tn. in Poland (since 1915), 30 m. s.w. of Wrocław (Breslau); pop. 16,560; Prussian victory over Austrians (1762); convention (1790) guaranteeing integrity of Turkey; alliance against Napoleon (1813).

Reichstadt [rîkh'shtadt]. Duke of, title given by European powers to Napoleon II (1811-32); son of Napoleon and Marie Louise; 5-323.

Reichstag [rîkh'stah]. Ger. legislative assembly; part of the Reichstag building in Berlin was burnt out by the Nazis in 1933; Hitler addresses, 7-485 illus.

Reid, Thomas Mayne (1818-83). Irish writer of tales of adventure and hunting romances; lived in U.S.A. (1840-49); • traded with Indians, fought in Mexican War. (*The Scalp Hunters*; *White Chief*; *The Rifle Rangers*; *The Boy Tar*; *Afloat in the Forest*); 2-356.

Reigate. Tn. in Surrey; about 21 m. s. of London; sand used in glass-making is obtained; pop. (including Redhill, an important riv. June), 42,230.

Reign of Terror, in Fr. Rev. (June 1793-July 1794), 3-469; Robespierre and, 6-415.

Reims. City of Fr., 85 m. E.N.E. of Paris; pop. 110,749; 6-379, 3-436; Ger. surrendered, May 7, 1945, 7-496.

Reincarnation, and caste system in Hinduism, 4-242.

Reindeer. Domesticated antlered deer found in N. Scandinavia, Siberia, Canada, and U.S.A., 6-379, 3-40; in Alaska, 1-88; migrating, 5-203 illus.; milk from, 5-205.

Reindeer, Lake, Saskatchewan, Canada; area 2,437 sq. m.; drained by Reindeer r., tributary of Churchill r., 6-500, 2-195.

Reindeer Moss. Type of lichen found in arctic and sub-arctic regions, 4-491.

Reinforced Concrete, 2-476.

Reinhardt [rînhahrt], Max (1873-1943). Ger. theatrical director, whose chief

aim was to bring the audience into the action of a play, side by side, as it were, with the actors; especially notable were *The Miracle*, *Oedipus Rex*, and *A Midsummer Night's Dream*.

Reith, John Charles Walshaw Reith, 1st Baron (b. 1889). Brit. administrator and engineer; director-general B.B.C. (1927-38); min. of works 1940-43; chairman Commonwealth Telecommunications Bd. 1946-50.

Reitz (rits), **Deneys** (1882-1944). S. African politician and writer; fought against Brit. in Boer War; in 1st World War served under Botha in Ger. W. Africa campaign and in Flanders; dep. prime min. Union of South Africa 1938-43; 7-92.

Relativity, 6-380; in atomic energy production, 1-300; Einstein's theory, 3-205; verified by eclipse (1919), 3-150; and non-detection of ether drift, 3-301.

Relay. Any piece of apparatus in which small electric power is used to control larger electric power. Example is the telephone relay, which works on magnetic principles, 7-238.

Relay Machine, type of calculating machine, 2-170.

Relief, in sculpture, 6-519; anc. Egyptian, 3-194 illus.; Persian, 6-129 illus.; Roman, 6-443 illus.

Religion, in art, 6-33; animal worship, 3-199, 7-75; A.A. and great religions, 1-260; Aztecs, 1-332; Buddhism, 2-107, 2-366, 4-44; conjuring and priestcraft, 2-185; Christianity, 2-379; Confucianism, 2-479; in anc. Egypt, 3-199; fire worship, 3-356; Hinduism, 4-178, 4-242; Jainism, 4-242; Jews, 4-373; magic and religion contrasted, 6-77; Mohammedanism, 5-87; music in early civilizations, 6-302; and salt, 6-190; Zoroastrianism, 6-93, 7-527.

Reliques of Ancient English Poetry (1765). Collection of ballads made by Thos. Percy, 1-351.

Remagen. Tn. of w. Ger. on site of Rom. *Almagnum*. Over Ludendorff rly. bridge here, only bridge left intact at Rhine, U.S. forces in 2nd World War made the first crossing of r., March 8, 1945, 7-496.

Remanence. In magnetism, the magnetic flux density remaining in a magnetic substance after the magnetizing force has been removed.

Remarque [remark], **Erich Maria** (b. 1898). Ger. novelist (*All Quiet on the Western Front*).

Rembrandt, van Rijn (1606-69). Dutch painter, 6-382, 5-383; use of light in pictures, 6-3; drawings by, 3-124 illus.; etchings, 3-300 illus.; Man in a Golden Helmet, 5-388 illus.

Remembrance Day, 6-383.

Remote Control, Automatic, electronic devices, 3-222.

Remus [rē'mus]. Twin brother of Romulus (q.v.), mythical founder of Rome.

Remus, Uncle. In Joel Chandler Harris's *Uncle Remus's Tales*, old plantation Negro with a fund of Negro songs and stories of Brer Rabbit and Brer Fox, 2-351.

Renaissance, The, 6-384; study of anatomy, 5-161; architecture in Eng., 1-212; Italian city states, 4-313; Leonardo da Vinci, 4-483; and Reformation, 6-376.

Renaissance work. Type of embroidery, 3-239, 238 illus.

Renan [renahn'], **Ernest** (1823-92) Fr. author, philosopher, and Biblical critic; studied for priesthood, but became exponent of scepticism (*Life of Jesus*).

Renfrew. Co. tn. of Renfrewshire, Scot.; shipbuilding, engineering and dyeing industries; pop. 17,093; 4-29, 6-388.

Renfrewshire. Co. of Scot.; area 240 sq. m.; pop. 324,652; co. tn. Renfrew, 6-387.

Reni, Guido (1571-1642). It. painter, 4-320; Aurora, 1-310 illus.

Rennes [reh]. Mfg. city 190 m. w. of

Paris on Vilaine and Ille rivers; pop. 113,780; cathedral, univ.; textiles, 3-437.

Rennet. Substance obtained from the fourth stomach of calves; in cheese-making, 2-314.

Rennie, John (1761-1821). Celebrated Brit. civil engineer, who was responsible for the construction of Southwark, old Waterloo, and London Bridges, the Kennet and Avon and other canals, and Shoerness and Chatham Dockyards; his second son, John (1794-1874), was knighted on the completion of London Bridge in 1831.

Rennin. Ferment in gastric juice, 3-90.

Re'no, Nevada. U.S.A. Largest city in state; pop. 32,497; state univ.; trade in farm produce, lumber, flour, etc.; notorious for the ease with which divorce is granted; 5-393.

Renoir [renwahr'], **Pierre Firmin Auguste** (1811-1919). Fr. painter, a leading Impressionist, 4-237, 3-419; Les Paraphutes, 3-448 illus.

Rent. In economics, 3-159.

Representation, and parl. constituencies, 6-88, 7-407.

Representatives, House of, Australian, 1-318; in U.S.A., 7-301.

Reproduction; cells, 2-287; of cryptogams, 6-530; eggs, 3-172; embryology, 3-239; in insects, 4-265; of lichens, 4-491; of liverworts, 4-526; seeds and spores, 6-523; of sponges, 7-138; of water plants, 7-420, 430.

Reptiles, 6-388; alligator, 1-113; crocodile, 2-532; eggs, 3-172; in evolution, 3-322; in geological times, 3-516; lizards, 4-528; pleurostoro, 3-425, 6-281; snakes, 7-74; tortoises and turtles, 7-294.

Repton. Vill. in Derbyshire, Eng., near Burton-on-Trent; chiefly noted for boys' public school, founded 1537.

Republican Party (U.S.A.), 7-361.

Repulse, H.M.S. Brit. battle-cruiser, completed 1916; sunk by Jap. aircraft off Malaya with H.M.S. *Prince of Wales*, Dec. 1941; 7-491.

Reservoirs. In armour, 1-244.

Reservoir; as a type of dam, 3-29; and flood control, 3-390; and water supplies, 7-425, 426.

Resht. Chief silk-making and exporting tn. of Persia, near Caspian Sea; pop. 110,000; 6-134.

Resins, 6-388, 4-107.

Resistance. The property of a substance whereby it resists the passage of electricity through it. Resistance, which is measured in ohms (Ω), causes electrical energy to be lost as heat. Measurement, 3-211.

Resistor. A piece of apparatus placed in an electrical circuit to resist the flow of current.

Respiration, 6-389, 1-141; effects of air pressure, 1-40; artificial, 3-367; and carbon dioxide, 2-220; and circulation of blood, 4-141; on Mt. Everest, 3-321; in lung-fish, 5-51; lungs and, 5-51; and oxygen, 1-81; of plants, 4-469, 470, 6-215; of snails, 7-73.

Restoration Drama, in Eng. literature, 3-287.

Resurrection of Jesus Christ, 4-367; basis of Christian doctrine, 2-379; and Easter, 3-154.

Rethy, Princess de (b. 1913). Wife of Leopold III of Belgium, formerly Marie Lillian Baels, 4-435.

Reticulated, ython, 6-315 illus.

Reticulum. Second stomach of a ruminant, 6-471.

Retina, of human eye, 3-332, 334; colour receptors in, 2-463, 464.

Retting. Process of soaking flax fibres in water, 4-514.

Retriever. Brit. sporting dog used for retrieving game, 3-102.

Return. See Architectural Terms.

Reuben [rē'bēn]. Eldest son of Jacob, ancestor of the tribe of Reuben.

Reuchlin [roikh'lin], **Johann** (1455-1522). Ger. scholar, pioneer of the "new learning" and of study of Hebrew and Greek in Ger.; made famous struggle against bigots who wished to burn or confiscate all Jewish books except Bible; 6-376.

Réunion [rā'nion'] (formerly Bourbon). Volcanic isl. in Indian Ocean, 400 m. n. of Madagascar; former French colony, became Dept. of France in 1947; area 970 sq. m.; pop. 221,000; sugar, rum, coffee, vanilla, spices.

Reuss. R. flowing into Lake Lucerne, Switz., 5-48.

Reuter [ro'iter], **Paul Julius**, Baron von (1821-99). Germano-Brit. h. founder of famous world-wide news-collecting service (1849).

Reval (Estonia). See Tallinn.

Reveal. See Architectural Terms.

Revelation, Book of, or Apocalypse. The 27th and last book of the New Testament; date and authorship disputed, but generally attributed to Apostle John.

Revenge. Eng. 16th cent. warship of 500 tons, commanded by Sir Richard Grenville in battle off the Azores in 1591, 4-96, 1-331.

Reverberatory furnace. Furnace with vaulted ceiling that deflects flame and heat, 3-190.

Revere [revər'], **Paul** (1735-1818). Amer. patriot; in the night of April 18, 1775, he rode from Boston to Lexington on horseback warning the colonists of the approach of Brit. soldiers; 2-22, 5-144.

Reverse, of coin, 5-224.

Reversion to type. Return of domesticated plant or animal to ancestral type.

Revised Version of the Bible, 1-143.

Revol'ver. Small firearm with revolving chambered cylinder, 3-360.

Rewa. Cap. of Vindhya Union, Rep. of India, pop. 31,000, 4-211.

Reykjavik [rē'kjav'hek']. Cap. and spt. of Iceland on S.W. coast, pop. 55,900; univ.; port rebound in winter, 4-233.

Reynard the Fox. Poem by Joh. Maseheld, 5-141.

Reynaud [rā'nō], **Paul** (b. 1878). I. statesman; prime min. 1910, 1. signed after Paris occupied by Germans, 7-158; arrested 1940; transferred 1942 to Oranienburg (Dachau) prison camp and released by Allied troops May 1945.

Reynolds, Sir Joshua (1723-92). Brit. portrait painter; 4th. pres. of the Royal Academy, 6-389, 3-241; and Gainsborough, 3-497; Age of Innocence, 3-266 illus.; *Laurier*, Sterne, 3-260 illus. f.; *Liberty*, party, 3-286 illus.

Rhabdomaney. The divination of water and minerals by means of a forked twig (of hazel) 7-127.

Rhadamanthus [radamanthus]. In Gk. myth., brother of Minos, king of Crete, made with him judge in underworld because of his *rhadamanthus* inflexible ty.

Rhayader. Tn. in Radnorshire, Wales, pop. 4,556; 6-353.

Rhea [rē'a]. In Gk. myth., sister and wife of Kronos, and mother of the chief gods, 7-522.

Rhea. Ostrich-like bird found in Amer., 7-97 illus.

Rhaetia. Rom. prov., with Noricum formed Duchy of Bavaria, 1-357.

Rheims (Fr.). See Reims.

Rheingold, Die. Opera by Wagner, story, 5-519.

Rhenium (Re). Chem. element, atomic no. 75; atomic weight 186.31; 3-221.

Rheostat. A resistor (q.v.) which can be altered to vary the amount of resistance a circuit offers to the passage of an electric current.

Rhesus Factor. Substance missing from the blood of 15 per cent. of the population (known as the Rhesus negative blood group); first discovered in blood of Rhesus monkey; necessitates, in case of blood transfusion, use of blood of the same group or birth of a child to Rh. negative mother and Rh. positive father (vice versa) calls for special precautions, 4-491.

Rhesus [rē'sus] or Bengal Monkey, N. India; 2 ft. long, tail 6-8 in. fur brown with greenish tinge; 3-1

sacred and found in precincts of Hindu temples; eats fruit and seeds, also insects; in its blood the Rheus Factor (q.v.) was found; 6-242, 241 illus. f.

Rhetoric, 6-390.

Rheumatism. Inflammatory disease attacking joints, muscles, or heart, either in acute or chronic form; and infra-red rays, 4-261.

Rheumatoid Arthritis, and lack of adrenalin, 4-28.

Rhine. R. of w. Europe rising in Swiss Alps and flowing 820 m. to the North Sea, 6-390; canal connexion with Rhne, 6-393; in 2nd World War, 7-196, 499 illus.

Rhineland-Palatinate. *Land* of Federal Republic of Ger.; area 7,652 sq. m.; pop. 2,993,632; cap. Mainz; 6-391, 4-3.

Rhine Province. Formerly the most w. province of Prussia, with area of 10,035 sq. m. and cap. at Coblenz; in 1919 divided between the Rhineland-Palatinate and North Rhine-Westphalia.

Rhinoceros, 6-392; in Africa, 1-65; hair, 5-100; horns of, 4-191.

Rhinoceros Beetle, 4-266, 1-115, 413 illus.

Rhinoceros Iguana, 4-235.

Rhizome. In botany a root-like underground stem; 6-451; of bracken, 2-37.

Rhizopoda. Class of unicellular animals with "false feet" (pseudopodia).

Rho, ρ, P (Rom. r, R). Seventeenth letter of Gk. alphabet.

Rhode Island. Smallest state of U.S.A.; area 1,214 sq. m.; pop. 791,996; cap. Providence, 6-392.

Rhode Island Red. Breed of poultry, 6-392, 6-278, 277 illus.

Rhodes, Cecil John (1853-1902). Brit. South African statesman and financier, 6-393; in S. African hist., 7-91; Rhodes scholarships, 6-20; (quote Schur, 7-91 illus.

Rhodes, Wilfred (b. 1877). Eng. cricketer; played for England; and many times for England; see under Cricket Records.

Rhodes, Isl. in Egean Sea, since 1917 a Gk. possession. Area 515 sq. m.; pop. 38,946; 6-392, 1-25; Colossus of Rhodes, 7-2, 3 illus., 2-463, 6-393.

Rhodesia. Region of s. cent. Africa comprising the Brit. protectorate of Northern Rhodesia and the Brit. colony Southern Rhodesia, 6-394; Brit. occupation, 1-53; and Commonwealth development, 2-81; copper, 2-503; tobacco, 7-287 illus. Federated with Nyasaland, 2-85.

Rhodes Scholarships, at Oxford Univ., 6-20, 6-393.

Rhodium (Rh). Chem. element; atomic no. 45; atomic weight 102.91; melting point 1,960° C.; 3-224; prevention of tarnishing, 3-225; as backing for mirrors, 5-225.

Rhododendron. Evergreen flowering shrub; 6-395; poisonous to cattle, 6-236; pollen grain, 3-399 illus.

Rhododendron maximum. Latin name for the Great Laurel, 4-456.

Rhodope [rod'op'i] Mts. A southern arm of the Balkans in Macedonia and Thrace.

Rhondda, David Alfred Thomas, Viscount (1856-1918). Brit. food controller in the 1st World War; for 22 years member of Parliament; made immense fortune from coal mines.

Rhondda, Viscountess (b. 1883). Daughter of preceding; prominent in women's movements; founded and edited *Time and Tide*.

Rhondda Valley. Thickly populated mining dist. in Glamorgan, Wales; pop. of Rhondda urban dist. 111,357.

Rhône. R. of Fr. and Switz., 507 m. long; 6-395; Hannibal's crossing, 4-127; in 2nd World War, 7-497 illus.

Rhône Glacier, and source of r. Rhône, 6-395.

Rhône-Marseilles Canal. Artificial waterway of Fr. linking Arles with

Marseilles. Length 48 m., opened 1916; 5-137.

Rhubarb. An edible plant, 6-396.

Rhum or Rum. Isl. of Inner Hebrides, Inverness-shire, Scot.; area 12 sq. m.; pop. 210; sheep and ponies raised; 4-275.

Rhus vernicifera. Varnish tree from which lacquer is made, 4-434.

Rhymney [rum'ni]. R. of Monmouthshire, length 30 m., 5-245.

Rhythm, in poetry, 6-233.

Rhythm (music). See Musical Terms (list).

Rial. See Money (list).

Rialto. Famous bridge in Venice, 7-387.

Ribalta, Francisco (1531-1628). Span. painter, 7-112.

Ribbentrop, Joachim von (1893-1946). Ger. Nazi politician. Ambassador in London (1936-38); for. min. 1938; hanged as war criminal, 1946.

Ribble. R. of w. Yorks and Lancs, Eng.; length 75 m., 4-141.

Ribbon-fish. Any of various deep-sea forms with long ribbon-like bodies; the oar-fish is an example.

Ribbon Grass. Tall grass, genus *Pleuris*. Native to N. temperate regions, 4-frontis.

Ribbon microphone, 5-191.

Ribera [ri'bera]. *Giuseppe* or *Jose de* (1588-1652). Span. painter; a leader of Neapolitan school in Italy; called *Lo Spagnoletto*, "Little Spaniard," 7-121.

Riboflavin, vitamin B₂; found in eggs, meat, esp. liver, cheese, wheat germ and yeast.

Ribs, of skeleton 1-144 diag., 7-60.

Ricardo [rikahr'dō], *David* (1772-1823). Brit. (Jewish) political economist, 3-160.

Ricci, David. See Rizzio, David.

Rice. A cereal, 6-396; and beriberi disease, 7-103; cultivation with tractor, 1-71 illus.; lightning as aid to crop in India, 4-506; rice field, 1-268 illus.; in Luzon, 6-157 illus.; in S. China, 2-303 illus.

Rice-bird or Bobolink. Found in N. Amer. during summer months; noted for its beautiful song.

Rice-paper, a delicate paper made from the pith of a Formosan shrub, *Papaia papyrifera*.

Rici, John (1682-1761). Pantomimist and theatrical manager; and harlequin pantomimes, 4-133.

Richard I (1157-99). King of Eng., 6-398; on third Crusade, 3-2; and Cyprus, 3-21; and Church of St. George, 3-520; and John, 4-378; and Philip II, 6-155.

Richard II (1367-1400). King of Eng., 6-399; and Wat. Tyler, 7-359; Henry of Lancaster's rising against, 4-162; renounces crown in favour of Henry, 7-301.

Richard III (1452-85). King of Eng., 6-399; murder of Edward V, 3-167, 6-151; battle of Bosworth Field, 2-23.

Richards, Sir Gordon (b. 1904). Brit. jockey, champion, since 1925 (except in 1926, 1930). Rode his 4,000th winner at Bath in July 1952. Rode first Derby winner 1953; knighted 1953.

Richards Hair Hygrometer, 4-225.

Richardson, Henry Handel, pen-name of Ethel Floren. Richardson (d. 1916). Australian novelist, 1-321.

Richardson, John (1797-1863). Canadian writer and journalist, 2-203.

Richardson, Sir Owen Willans (b. 1879). Brit. physicist; prof. of physics at Princeton Univ., U.S.A. (1900-14); at King's College, London (1914-24); Nobel prize in physics 1928 (*Electron Theory of Matter, The Emission of Electricity from Hot Bodies*).

Richardson, Sir Ralph David (b. 1902). Brit. actor, joint director of Old Vic, 1944-48; Shakespearean parts; also appeared in films; knighted 1947.

Richardson, Samuel (1689-1761). Eng. novelist; 5-471, 3-288.

Richelieu, Cardinal (1585-1642). Fr. statesman, 6-400; rule and policy, 3-450; foundation of Fr. Academy,

1-9; and Thirty Years' War, 7-270; as minister to Louis XIII, 5-41; and Marie de' Medici, 5-100; and Mazarin, 5-130; portrait, 3-141.

Richelleu work. Embroidery, 3-239.

Richmond. Residential borough in Surrey, Eng., 9 m. s.w. of London, situated on r. Thames; Chaucer, Bacon, Keats, and other eminent men lived in the town; Elizabeth I died in former Richmond Palace; famous royal park, enclosed by Charles I.; pop. 41,915, 7-196.

Richmond, Tn. in s. Riding of York-shire, Eng., on r. Swale; ruins of famous castle built about 1071; pop. 6,165.

Richmond. Cap. and river port of Virginia, U.S.A. Greatest cigarette manufacturing centre in the world. Pop. 230,310; 7-103.

Richmond, or Staten Island; one of the five boroughs of New York City, 5-110.

Richmond and Lennox, Frances Teresa Stewart, Duchess of (1617-1702). Model for Britannia on coinage, 2-79.

Richter, Johann Paul Friedrich (1763-1825). Ger. novelist and humorist; commonly called "Jean Paul"; chief works *Quintus Picken, Hagele-fahre* (Hill Oats), 4-13.

Rickets. A bone disease, 7-61, 1-519, 7-403, 404.

Ricketts, Charles (1866-1931). Brit. painter, designer, and printer; designed types used by his private (Vale) press (1896-1901); famed for his theoretical designs.

Rickshaw. Light man-drawn carriage, said to have been invented in 1869 by a Baptist missionary in Japan.

Rideau Lake, Ontario. At its best level of Indian canal; 21 m. long.

Rideau River, Canada; and Rideau canal, 6-9, 10.

Ridge. See Architectural Terms.

Ridgway, General Matthew Bunker (b. 1895). U.S. soldier. Commanded an airborne division during 2nd World War; appointed to command U.S. 8th Army in Korea 1950; succeeded Gen. MacArthur in Far East commands 1951; appointed Supreme Commander of Allied Powers in Europe 1952; U.S. Army Chief of Staff 1953, 4-126.

Riding. Art of horsemanship, 6-400; importance of placing weight, 4-196; trick riding in circus, 2-101.

Riding Light. See Nautical Terms.

Ridings, of Yorkshire, 7-515, 516.

Ridley, Nicholas (c. 1500-55). Eng. Protestant reformer and martyr, Bishop of Rochester; burned for heresy; with Luther, 4-118.

Riebeck, Jan van (d. 1677). Dutch founder of Cape Town, 2-217, 7-89.

Riel [ri'el], *Louis* (1814-85). Canadian half breed, leader of Red River (1870) and Saskatchewan (1885) rebellions.

Riemann, Georg Friedrich Bernhard (1826-66). Ger. mathematician, 5-149; Riemannian geometry, 3-519, 6-381.

Rienzi [ri'ent'zi], *Cola di* (c. 1313-54). Rom. revolutionist; overthrew aristocracy and attempted to re-establish Rom. republic and world rule; hero of Bulwer-Lytton's *Rienzi, The Last of the Roman Tribunes*.

Rienzi. Opera by Wagner, 7-408.

Rif. Range of mts. in Morocco, 5-264.

Rifle. Firearm, 3-359; shooting at Hakey, 7-42.

Rifling. In gun-barrels, 1-258; 3-359.

Rig or Run Rig System. In agriculture; in Scotland, 1-77.

Riga. Cap. of the Latvian S.S.R.; pop. (1939) 393,000; 6-402, 4-453.

Riga, Gulf of, Inlet of Baltic Sea between Latvia and Estonia S.S.R., 100 by 60 m.; named after city 7 m. above.

Riga, Treaty of. Treaty between Russia and Poland signed March 18, 1921, by which Poland gained about 44,000 sq. m. with a population of 3,685,000; 6-240.

Rigaud, Hyacinthe (1659-1713). Fr. portrait painter, 3-439.
Rigel, Star of the first magnitude, 7-146.
Rights. See *Stock Exchange Terms*.
Rights of Man, Declaration of (1791), 3-468.
Right Whale, 7-446 illus.
Rigi, Mt. (5,906 ft.) overlooking Lake Lucerne, Switz., 5-48.
Rigoletto. Opera by Verdi; story, 5-519.
Rig-Veda. Oldest collection of Hindu hymns and poems; 4-219, 251.
Rilke, Rainer Maria (1875-1926). Poet, (Czech by birth, who wrote in German; *Not-book of Malle Laurids Bridge* (prose account of terrors of his childhood), *Duno Elgus, Sonnets to Orpheus*; 4-11.
Rima. Sculpture by Epstein, 3-294 illus.
Rimbaud (frambô), Jean N. A. (1854-91). Fr. poet; friend of Verlaine; his influence gave rise to the Symbolist movement; wrote most of his poetry before he was 20; *Le Bateau Ivre, Les Illuminations*.
Rimini, It. Historic tn. on Adriatic Sea, 65 m. s.e. of Bologna; pop. 65,000; bathing resort, fisheries; anc. Ariminum.
Rimsky-Korsakov (rim'ski kor'sahkof), Nicholas Andreievich (1844-1908). Russian composer of symphonies and other orchestral pieces (*Le Coq d'Or* (opera), *Scheherazade*); 5-306, 5-515.
Rimu. Timber tree grown in New Zealand, 5-422.
Rinderpest. An infectious disease, believed to be caused by a virus affecting cattle, sheep, goats, etc.
Ring. A circle of jewelry; mourning rings, 4-372.
Ring and the Book, The. Poem (1868-69) by Browning, 2-96.
Ringed Plover. Bird of the plover family, 6-226; egg, 1-452 illus. f.; nest, 1-459 illus.
Ringed worms, or Annelids. Worms with round, segmented bodies, including earthworms (q.v.).
Ringlet butterfly, 2-139 illus.
Ring-necked Parakeet, 6-92.
Ring of the Nibelungs, The. Vast opera cycle by Richard Wagner, 7-409, 5-129; stories of the operas, 5-519.
Ring Ouzel. Songbird (*Turdus torquatus*) allied to thrush, native to Europe. Summer visitor to Eng. Black feathers, edged white; white crescent on breast; migration, 5-204 illus. f.
Ring-tailed Lemur, 4-478.
Ringworm, a fungus disease; treatment, 3-489.
Rink. For ice hockey, 4-232.
Riohamba or Bolivar. Historic city of Ecuador; Inca palace remains; cath.; pop. 19,500.
Rio de Janeiro. State of Brazil; produces coffee, rice, sugar, etc.; area 26,627 sq. m.; pop. 2,070,660; cap. Niterôy.
Rio de Janeiro. Cap. of the Brazilian Republic and second largest city of S. Amer.; pop. 2,413,152; 6-402, 2-48.
Rio de Oro. Sp. colony on w. coast of Africa, s. of Morocco; area with Adrar 109,200 sq. m.; European pop. 840; arid sandy plateau.
Rio Forcados. Channel in the Niger delta, 5-135.
Rio Grande. Riv. of N. Amer. forming part of boundary between U.S.A. and Mexico; 2,200 m. from source in Colorado to Gulf of Mexico; 5-186, 5-452.
Riom (riayn). Tn. of Fr. in Puy-de-Dôme dept., 8 m. n. of Clermont-Ferrand; tobacco, linen, wine; pop. 12,975. Here in 1942 Fr. Vichy govt. brought to trial politicians and soldiers alleged to be responsible for French collapse in 1940; trials never concluded.
Rio Muni or Spanish Guinea. Sp. colony in w. equatorial Africa on E. coast of Gulf of Guinea; 10,036 sq. m.; pop. 139,000; chief tn. Bata;

cap. Sta. Isabel on Fernando Po Island.

Rio Negro. One of chief tributaries of Amazon; rises in Colombia, flows E. 1,000 m. through N. Brazil.
Rio Negro. R. in cent. Argentina flowing E. 700 m. from Andes in Chile to Atlantic.
Rio Negro. R. in cent. Uruguay flowing w. 300 m. to Uruguay r.
Rio Nun. Main channel in Niger river delta, 5-435.
Rio Tinto. Minas de. Tn. of Spain on r. Tinto, so called from the discoloration of the river's waters by copper ore, ancient mines, 5-215.
Riouw Archipelago, Indonesia, 4-257.
Rip-cord, of parachute, 6-72; in balloon, 1-354.
Ripon. Cath. city in W. Riding of Yorks, Eng. Agricultural market and leather mfrs. Pop. 9,164.
Riposte, in fencing, 3-346.
Rip Van Winkle. Story by Washington Irving, 4-297, 2-351.
Riser. See *Architectural Terms*.
Risorgimento. The revival of Italian patriotism during 19th cent., 4-330.
Rissik, Johannes. Surveyor-general of the Transvaal; and Johannesburg, 4-377.
Ritter, Karl (1779-1859). Ger. geographer, founder of comparative geography.
Riva. Small tn. on shores of Lake Garda, Italy, 4-342 illus.
Rivals, The (1775). Comedy by R. B. Sheridan, 7-26.
River-hog. Pig of genus *Polamochoerus* found in the swampy forests of W. Africa; is responsible for much damage to plantations.
Riverina. Sheep-rearing, wheat growing dist. of New South Wales, Australia. Entirely lowland, it is irrigated by the Murrumbidgee and other rivers on its boundaries.
River Police, Thames Division, 6-250 with illus.
Rivers, of Asia, 1-268; bore 2-17; floods, 3-390; and salt in sea-water, 5-496; and valleys, 7-375. See also *Dam* and *Individual rivers* by name.

WORLD'S LONGEST RIVERS

Name	Continent	Length in m.
Missouri-Mississippi	N. Amer.	3,872
Nile	Africa	3,500
Amazon	S. Amer.	3,350
Yangtze	Asia	3,400
Congo	Africa	3,000
Yenisei	Asia	3,000
Amur	Asia	2,920
Lena	Asia	2,860
Hwang-ho	Asia	2,800
Mekong	Asia	2,800
Niger	Africa	2,800
Mackenzie	N. Amer.	2,500
Ob	Asia	2,500
Volga	Europe	2,500

Riveting, of ships, 7-41.
Riviera. Picturesque dist. bordering Mediterranean Sea between Nice, Fr., and Spezia, It.; favourite winter resort, 6-403, 3-434.
Rivoli (rô'vôli). VII. in N. Italy 75 m. w. of Venice, noted for Napoleon's victory over Austrians in 1797.
Riyadh. Polit. cap. of Saudi Arabia; pop. 80,000; 1-190.
Riyal. See *Money* (II-1).
Rizzio (rî'tsô) or *Riccio*, David (c. 1533-66). Ital. musician and secretary of Mary Queen of Scots; murder, 5-412 with illus.
Rjondane Fjeld. Mts. in Norway, highest point Høgronden (6,929 ft.), 5-462.
Roach and other coarse fish, 6-403; bait, 3-383.
Roads, 6-404; asphalt paving, 1-274, 275; banking of, 2-293; cycle road-racing, 3-16; McAdam and, 5-57; Roman, 6-428; traffic signals, 7-53. See also *Road Safety*; *Road Transport*.

Road Safety, 6-408.
Road Signs, 6-405 illus. f.
Road Transport, 6-409, 412 illus. f.
Roan. Species of antelope, 1-171.
Roanne (rôan'), Fr. Mfr. and rly centre 40 m. s.w. of Lyons; pop. 44,500; head of navigation on r. Loire.
Roanoke (rô'ânôk), Virginia, U.S.A. Industrial city in s.w. on Roanoke r.; pop. 91,921; 7-403.
Roanoke Island. Isl. 10 by 2 m., off coast of N. Carolina, U.S.A.; unsuccessful colony founded by Raleigh (1585-87), 2-215.
Roaring Forties. Region between 40th and 50th parallels in S. Atlantic Ocean; characterised by strong westerly winds; 7-459.
Roasting. In cookery, 2-196.
Roast Pig, A Dissertation Upon. Essay by Charles Lamb, 4-441.
Robber-fly. Large fly of the family *Asilidae*, seen in dry, heathy places; orange and blue, pointed body, brownish-tinted wings; a predaceous, useful insect.
Robert I, Duke of Normandy (d. 1035). Father of William the Conqueror, his great strength and ferocity subject of medieval legends; aided Edward the Confessor in exile.
Robert II, Duke of Normandy (c. 1054-1134). Son of William I, succeeded to Normandy; in First Crusade, 3-1.
Robert I (Bruce). King of Scotland See *Bruce, Robert*.
Robert II (1316-90). King of Scotland, grandson of Robert Bruce; founded Stuart line.
Robert III (c. 1340-1406). King of Scotland; came to the throne in 1390, a weak ruler, his reign was an unhappy one, and he died broken-hearted.
Robert Guiscard (gô'skahr) ("the resourceful") (1015-85). Norman soldier of fortune; began conquest of Sicily from the Saracens (completed by his brother Roger I and consolidated by his nephew Roger II), becoming Duke of Apulia and Calabria; 4-308.
Roberts, Bartholomew (d. 1722). Eng. pirate, 6-206.
Roberts, Sir Charles George Douglas (1860-1943). Canadian poet and author of animal stories, 2-203.
Roberts of Kandahar, Frederick Sleigh
Roberts, Earl (1832-1914). Brit. soldier, 6-414; in 2nd Afghan War, 1-47; in Boer War, 1-302.
Robertson, Thomas William (1829-71). Brit. dramatist. His best-known play, *Castle* (1867).
Robertson, Sir William Robert (1860-1933). Brit. field-marshal who rose from the ranks; in 1915 was Gen. French's chief of staff; Dec. 1914 to Feb. 1918 C.I.G.S.; commander Brit. Army on Rhine (1919-20); K.M. (1920).
Robeson, Paul (b. 1898). Negro stage and film actor and singer; won fame in *The Emperor Jones*, and in *Sho! Boal*; interpreter of Negro spirituals.
Robespierre, Maximilien Marie Isidore (1758-94). Fr. Revolutionary leader 6-414; and Danton, 3-47; and Reign of Terror, 3-469.
Robey, Sir George (1869-1954). Eng. comedian famous on music-hall stage and in revue; real name George Edward Wade; knighted 1954.
Robin. Bird of the family *Turdidae*, 6-415, 1-455 illus.; egg, 1-452 illus. f.; incubation of eggs, 1-460 high speed photography, 6-181 illus. nest and eggs, 6-416 illus.
Robin Hood. Famous English outlaw 6-416.
Robin Hood and His Merry Men. Story, 6-417.
Robin Hood's Bay. Picturesque seaside resort in N. Riding of Yorkshire 7 m. s.e. of Whitby.
Robinson, Edwin Arlington (1869-1935). Amer. poet, 7-366.
Robinson, John (c. 1575-1625). Eng. puritan divine, pastor of Leiden congregation of Pilgrim Fathers;

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- organized Mayflower colony, but died at Leiden, Netherlands.
- Robinson, Lennox** (b. 1886). Irish dramatist. 4-287.
- Robot** [rô'bot]. Term derived from Czechoslovak word meaning "work." Came into common use in England after the production of Karel Capek's play *R.U.R.* (Rossum's Universal Robots) in 1923; applied to various kinds of mechanisms which carry out tasks previously done by manual labour; 2-41.
- Rob Roy**. Popular name for Robert MacGregor (1671-1734), notorious Highland robber and raider, for years an outlaw; central figure of Scott's novel of the same name. Not to be confused with John MacGregor who invented the Rob Roy canoe.
- Robart, Amy** (c. 1532-60). Wife of Robert Dudley, Earl of Leicester, who was suspected of having caused her sudden death in order that he might be free to marry Queen Elizabeth I; story told in Scott's *Kenilworth*, 4-397, 3-232.
- Robson, Mt.** British Columbia. One of highest peaks of Canadian Rocky Mts. (12,972 ft.).
- Roë [rôk]**. A monster bird in Arabian legend, said to have its home in Madagascar, so large that it could carry off elephants, and Sindbad the Sailor tells of an egg which was "50 paces in circumference."
- Rochdale**. Mfg. tn. in Lancs, Eng., 10 m. N.E. of Manchester; pop. 57,734; cotton and woollen goods; "Rochdale Pioneers," first Eng. co-operative society, founded in 1811; 2-499, 4-411.
- Roche, Mazo de la** (b. 1885). French-Canadian writer, 2-203.
- Rochefort, Fr.** Fortified naval harbour 75 m. N. of Bordeaux near mouth of r. Charente; pop. 25,000; near by Napoleon surrendered to British in 1815.
- Rochefoucauld, François de la**. See *La Rochefoucauld*.
- Rochelle, La**. See *La Rochelle*.
- Rochelle Salt**. Sodium potassium sulfate; in crystal pick-up, 4-59; and piezo-electricity, 6-196; in sugar analysis, 7-226.
- Roche moutonnées**. In geology; as evidence of ice age, 4-228 illus.
- Rocheater**. Cath. city and port on 1. Midway Kent, pop. 43,899; 6-421; dockyard, 4-398.
- Rochester, New York, U.S.A.** mfg. city in w. of state; pop. 332,488; univ. and various industries, including machinery, flour, boot and shoe, and camera mfrs.
- Rochester, John Wilmot, 2nd Earl of** (1647-80). Eng. courtier and poet; lines on Charles II, 2-307.
- Rock climbing, mountaineering**, 5-284.
- Rock Crystal**, clear natural quartz; used for optical instruments, 6-320.
- Rock-dove**. Bird, 6-198.
- Rockefeller, John Davison** (1839-1937). Amer. founder of Standard Oil Co. When he retired in 1911 he had given \$150 million to education and charities.
- Rockefeller Centre**. New York City, 5-410.
- Rocket**. Military weapon, 6-421; as type of jet engine, 4-371; as guided missile, 4-103; gunpowder and jet propulsion, 4-370; early rocket-propelled aircraft, 1-31.
- Rocket, The**. Locomotive designed and built by George and Robert Stephenson in 1829, 7-155, 5-1 illus.
- Rocket bomb**, 6-421, 4-103; London raids, 6-28.
- Rocket-propelled vehicles, experimental cars**, 6-422.
- Rockford, Illinois, U.S.A.** Mfg. city 75 m. w. of Chicago on Rock r.; pop. 92,927; Rockford College.
- Rockhampton**. Port in Queensland, on Fitzroy r. near E. coast; pop. 34,000; trade in gold, meat; 6-324.
- Rockingham, Charles Watson-Wentworth, 2nd Marquess of** (1730-82).

- Brit. statesman; as prime minister 1765-66 tried to conciliate Amer. colonies by repealing Stamp Act.
- Rock-pipit**. Bird, 6-205.
- Rock-rose**. Perennial trailing plant; length up to 1 ft.; leaves small, oblong, upper surface hairy; flowers yellow; 2-21 illus. f.
- Roofs, in geology**, 6-424, 3-515, 516; minerals in, 5-211; primary and secondary, 3-151; sand, 6-495.
- Rock Salmon**. The commercial name for dog-fish, 7-18.
- Rock salt, mining in Poland**, 6-491.
- Rocky Mountain goat**, 1-171.
- Rocky Mountain Park**, in Colorado, U.S.A., 50 m. N.W. of Denver; 359 sq. m.; has many high peaks.
- Rocky Mountains**. Chain of mts. which runs through N. Amer. from s. border of Mexico to Alaska, 6-424 with illus. f., 5-452; reserves in Canada, 1-91; Connaught tunnel, 7-328; parks, 5-453; Yellowstone Park, 7-513.
- Rocky Mountain sheep**, 7-20.
- Rococo** [rôkô'kô]. In architecture, a florid style of decoration which succeeded the style adopted by Louis XIV and XV, and which exaggerated the main features and peculiarities of that fashion; sometimes a term employed to denote bad taste in design and ornament generally; Fr. painting and, 3-439.
- Rod, Pole, or Perch**, a unit of measure. See *Weights and Measures*.
- Rod Cells**, of eye; visual purple and night vision, 3-332, 334.
- Rodents**. (Including mammals of the *Rodentia* family). Numerous species, widely distributed. Include beavers, lemmings, mice, rats, hares, rabbits, porcupines, jerboas. All have broad chisel-like incisor teeth, which grow to counter wear on the gnawing surfaces, 5-103, 101 illus.; beaver, 1-100; eaten by birds, 1-455.
- Rodeo** [rôdô'ô]. Sp.-Amer. term for the driving together of cattle for branding, counting, etc.; a round-up; also the enclosure into which they are driven. Term also popularly used for a "Wild West" display of trick riding, etc.
- Rodin (François), Auguste** (1810-1917). Fr. sculptor, 6-425; influence on Fr. art, 6-521; sculpture, 6-125 illus. f.
- Roding, It. in Essex, Eng.**, trib. of the Thames, length 31 m.
- Rodney, George Brydges Rodney, 1st Baron** (1719-92). Brit. admiral; somewhat boastful, but a skilful seaman, he was the victor of many naval encounters; he defeated the Sp. off Finisterre and St. Vincent and relieved Gibraltar in 1780 and then set off for the W. Indies, where he won a great victory over the Fr. off St. Lucia in 1782.
- Rodrigues Cabrillo, Juan** (d. 1543). Portuguese explorer; discovery of California, 2-177.
- Rodrigues [rôdrê'gês]**. Isl. in Indian Ocean; dependency of Brit. Mauritius; 42 sq. m.; pop. 11,900; Mathurin is principal tn. and port.
- Roe, Sir Alliot Verdon** (b. 1877). Brit. aviation pioneer and aircraft constructor, 1-38.
- Roe, Sir Thomas** (1581-1614). First Eng. ambassador to India; before the great Mogul, 3-252 illus.
- Roebuck, or Roe-deer**. A small deer (*Capreolus caprea*) of Europe and W. Asia, 3-60.
- Roedean School**. Famous girls' public school, near Brighton, Sussex.
- Roemer [rô'mer] or Römer, Ole** (1644-1710). Danish astronomer; measures speed of light; 4-498.
- Roeskilde [rôskilde] or Roskilde**, Denmark. Old tn. 18 m. w. of Copenhagen on Zealand Isl.; cap. until 1443; cath. with tombs of early Danish kings.
- Roger of Wendover** (d. 1236). Monk of St. Alban's Abbey; with Matthew Paris wrote chronicle in 13th cent., 4-181.
- Rogers, Ginger** (b. 1911). Amer. film actress and dancer, 3-40.

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- Rogers, John** (c. 1500-55). Eng. martyr, burned at stake for preaching against Catholicism; and Great Bible, 1-413.
- Rogers, Samuel** (1763-1835). Brit. banker, poet, art patron; published poems which, if not brilliant, showed care and taste (*Italy: Poems*; *Phrases of Memory*); declined laureateship after death of Wordsworth.
- Rogers, Capt. Woodes** (d. 1732). Eng. sailor; and Alexander Selkirk, 3-3; and Dampier, 3-36.
- Rogers, Mt.** Peak in Blue Ridge Mts., Virginia, U.S.A., 5,720 ft., 7-103.
- Rogot, Peter Mark** (1779-1869). Brit. scientist and philologist of Huguenot descent; discovered phenomenon of persistence of vision, on which cinema is based, 2-389; helped to establish Univ. of London, and published the famous *Thesaurus of English Words and Phrases*.
- Roggeveen, Jacob** (1659-1729). Dutch navigator; travelled round world in 1721; discovered Easter Isl. and Samoan Isl., 6-29, 6-191.
- Rohan [rôahn'] Henri, Duke of** (1579-1638). Fr. Huguenot general, leader of Prot. party after death of Henry IV; secured confirmation (1623) of Edict of Nantes.
- Rohan, Louis René, Prince de** (1734-1803). Fr. cardinal, ambassador to Austria (1772-74) and grand almoner of Fr.; imprisoned 1785-86 for his connexion with the Diamond Necklace Affair.
- Röhm, Ernst** (1887-1934). Ger. Nazi leader, once close friend of Hitler. Murdered by Hitler's orders; 4-182.
- Rokitansky, Karl von** (1804-78). Austrian physician; one of the founders of modern pathological anatomy, 5-102.
- Rokossovsky, Konstantin** (b. 1887). Russ. soldier; commander of Army of the Don, distinguished himself at Stalingrad (1942-43); led 1st, then 2nd White Russ. armies, in Poland and in conquest of E. Prussia 1944-45; marshal 1944. In 1949 appointed Marshal of Poland, def. min. and chief of the Polish armed forces; deputy premier, 1952; 6-212.
- Roland**. Frankish soldier, celebrated in legend as the greatest of Charlemagne's paladins, who according to tradition died in battle with the Moors in 778 in the pass of Roncesvalles; 3-431; medieval Fr. poem, 3-151.
- Rolland [rôlahn'] Romain** (1860-1941). Fr. novelist and uncompromising idealist and anti-militarist (*Jean Christophe*; *Libu*; *Colas Ingegnon*; *Pierre et Lucie*); was Nobel prizewinner in 1915.
- Roll Brimstone** (roll sulphur), 7-186.
- Rolled Steel Joists**, in bridge design, 2-62 with diag.
- Roller**. A bird related to the kingfisher and chiefly native to tropical countries. It tumbles like a tumbler pigeon; only one species in Europe.
- Roller**. Its place in the evolution of the wheel, 7-448.
- Roller Bearings**. See *Bearings*.
- Rolling Mill**. Steel-works, 4-295.
- Rollo** (c. 860-932). Norse conqueror of what became the Duchy of Normandy; settlement in Normandy, 5-418.
- Rolls, Hon. Charles Stewart** (1877-1910). Brit. motorist and aviator. Joint founder, with Henry Royce, of the firm of Rolls-Royce, Ltd. First Englishman to be killed while flying an aeroplane (at a Bournemouth meeting), 1-39.
- Rolls-Royce engines**, 5-111; Merlin XV aero engine, 1-42 diag.
- Roll Sulphur** (roll brimstone), 7-186.
- Romagna [rômah'nyä]**. Former prov. of Papal States, now divided into 11 provs. of Bologna, Ferrara, Ravenna, and Forlì, 4-304.
- Romano**. Modern Gk. language; compared with Classical Gk., 4-94.
- Romains [roman'] Jules** (b. 1885). Pen-name of Louis Farigoule, French novelist and playwright. Principal

works: *Dr. Knock* (play); *Men of Don't Wait* (series of novels); 3-456.
Roman Alphabet, 1-120.
Roman Catholic Church, 6-426; confirmation, 2-479; in Ireland, 4-281, 282; papacy, 6-40; St. Peter as first b'ish'p of Rome, 6-145; and Reformation, 6-376; and Roman law, 4-458; and Vulgate Bible, 1-442; the Vatican, 7-382.
Romance, in Middle Ages, 5-471; King Arthur and the Round Table, 1-256, 6-456, 5-97; the Cid, 7-105; burlesqued by Cervantes, 2-294.
Romance Languages, 6-427, 4-449, 4-329.
Roman Cement, and bridge building, 2-60.
Romanes [rōmah'nos], George John (1818-94), Brit. naturalist (*The Philosophy of Natural History before and after Darwin*); founded Romanesque Lecture at Oxford.
Romanesque Architecture, 1-210; in Spain, 7-112.
Romania [rōmah'nē], Cape, Headland at s.e. extremity of Malay Peninsula, 1-204.
Roman Law, 4-158; the *ius gentium*, 4-169; Lex Mosaicus, 6-430.
Romaucio, Giulio (c. 1392-1519), Ital. artist; Constantine at battle of the Milvian bridge, 2-189 illus.
Romanov [rōmah'nov], Family name of Tsars of Russia from 1613 to downfall of the empire, 1917.
Romans, Epistle to the. Book of New Testament; letter written by Paul to the Christians at Rome; deals with justification by faith and relations of Jews and Christians.
Romans, King of the. Name for the emperor of the Holy Roman Empire (see list p. 350).
Romansch [rōmah'nsh'], Dialect and 14th national language of Switzerland; 6-427, 7-312.
Romantic Movement. In literature, the tendency to emphasize the imaginative, emotional, and natural, as opposed to the restraint and formality of classicism and the matter-of-fact attitude of realism; applied especially to movement in later 18th and early 19th cents.; in Eng. literature, 3-289; in Fr. literature, 3-455, 456; Hugo's influence, 4-201.

Roman Wall (Gt. Brit.). See **Hadrian's Wall**.
Romany. Gypsy language, 4-109; Borrow and, 2-20.
Rome. City and cap. of Italy; pop. 1,895,477; 6-427, 4-304; Colosseum, 2-461; bishop as supreme head of R.C. Church, 6-61; sacked by Imperial army (1527), 4-314; railway station, 4-316 illus.; riv. Tiber, 7-272; Vatican City and State, 7-382, 383; monument to Victor Emmanuel, 6-428 illus. f.; in 2nd World War, 7-494.
Rome, History of, 6-429; map, 6-433; Aeneas ancestor of Roman Kings, 1-25; and Etruscans, 3-305; ships, 7-28; Latin League and the Gauls, 6-430; war with Pyrrhus, 6-314; wars with Carthage, 2-255; Hannibal, 4-127; colonisation in Spain, 7-105; conquest of Greece, 4-73, 77; army organization, 1-246; legions, 4-475; eagle standard, 3-145; civil service, 2-404; the Gracchi, 6-433; Marius and Sulla, 6-433; Julius Caesar's reforms, 2-162, 163; Pompey the Great, 6-258; Palestine as Rom. prov., 6-15, 4-375; Pontius Pilate, 4-367; conquests in N. Africa, 1-53; invasion of Brit., 2 71, 75; and Masada, 5-137.
The Empire: Augustan Age, 1-309; expeditions and conquest of Brit., 3-275; oppression of Christianity, 2-379; rule of Nero, 5-367; Hadrian, 6-439, 4-363; Marcus Aurelius, 5-123; and Parthian Empire, 6-131; Constantine and division of Roman empire, 2-436, 6-439; barbarian invasions, 5-201, 4-5; Goths capture Rome, 4-48; invasions of Attila, 1-306, 4-208. See also Byzantine Empire.
Social History: use of abacus, 1-237; agriculture, 1-71; aqueducts, 1-188, 189; arch, 1-201; archery, 1-207; architecture, 1-209, 5-532; use of asbestos, 1-262; brick-making, 2-57; bridge-building, 2-61, 64; butler masques, 2-135; calendar, 2-174, 5-255; cattle, 2-273; cement, 2-288; census, 2-291; circuses, 2-403, 404; coins, 5-235; costume, 2-420; drama, 3-116; fish trade, 3-378;

food and colonial expansion, 3-408; foot measure, 3-414; Forum, 6-435 illus.; gravestones, 4-476 illus.; helmet, 2-89 illus.; ink, 4-262; mass-produced lamps, 4-442; Latin language and literature, 4-449; laundries, 4-454; lighthouses, 4-502; locks, 4-535; medicine, 5-161; music, 5-302; numerals, 5-475; life in Pompeii, 6-257; postal system, 6-270; religious tolerance, 5-198; roads, 6-404; Roman London, 5-19, 20 illus.; salt money, 6-490; sandals, 2-13; shorthand, 7-43; silks, 7-53; silver ware, 6-439 illus.; slavery, 7-65; soap, 7-78; stylus and writing tablet, 6-111 illus.; theatres, 7-264; tools and utensils, 6-434 illus.; status of wives, 5-135; writing materials, 2-1 illus.

Rome; Painting and Sculpture, 6-440, 6-442-448 illus.

Rome, University of, 6-429.

Rome-Berlin Axis. Political collaboration between Italy and Germany inaugurated Oct. 25, 1936; became a full political and military treaty of alliance May 22, 1939; 7-485 5-311, 3-317.

Romeo and Juliet. Tragedy by William Shakespeare, 6-449, 7-11.

Römer, Ole. See **Roemer, Ole**.

Romford. Tn. in Essex, 12 m. N.W. of London; brewing, engineering; pop. 87,991; 3-298.

Rommel, Erwin E. J. (1891-1944); Ger. soldier; led Panzer div. in Fr. 1940; in N. Africa successful against Brit. 8th army until defeated at Alamain, 1-37; committed suicide Oct. 14, 1941.

Romney, George (1734-1802). Brit. portrait painter, chiefly famous for portraits of Lady Hamilton, who was also his model for a large number of other paintings; called as a painter of women and children, 3-260, 259 illus.

Romney, Bor. of Kent, Eng., one of the Cinque ports, 2-402.

Romney Marsh, Kent, 4-398.

Romsdal. Valley in cent. Norway.

5-166 illus.

Romsey. Tn. of Hants, Eng., on the r. Test; pop. 6,280.

Romulus. In Ancient Roman legend twin brother to Remus, son of the vestal virgin Sylvia. The mother was condemned to be buried alive and the children thrown into the Tiber. The boys were rescued however, and suckled by a she wolf. Afterwards they resolved to found a city, but quarrelled as to its situation, and in the conflict Remus was killed. This left Romulus free to act upon his own choice, and Rome was accordingly built; 6-129, 5-136.
Romulus Augustulus. Rom. emperor deposed in 476, 6-139.

Ronald, Sir Landon (1873-1938). Brit. musician. Wrote a large number of popular ballads ("Down in the Forest"); principal of the Guildhall School of Music (1910-37).

Roncesvalles [rōnthāvah'yās]. Vil. in N. Sp. near pass in w. Pyrenees where Charlemagne's rearward was defeated and Roland slain, 3-434.

Ronda. Tn. of S. Spain; pop. 32,600, 7-104 illus. f.

Rondo. See **Musical Terms** (list).

Ronsard [rāwnsahr], Pierre de (1524-85). Fr. "prince of poets"; leader of the Pléiade, a group of writers who sought to remodel Fr. language and poetry on classical lines, 3-41.

Röntgen [rēnt'gen], Wilhelm Konrad (1845-1923). Ger. physicist; Nobel prizewinner in 1901; discovered X-rays, 7-507.

Röntgen Rays. See **X-rays**.

Röntgen Unit. See **R Unit**.

Rood. Brit. unit of measurement equal to 1 acre (40 sq. poles). Sh divided into 40 rods or 1,210 sq. yd.
"Roof of the World", the Pam plateau, 7-272.

Rook. Bird of the crow family, 6-449 effect on crops, 3-153; eggs, 1-45 illus. f.; nest, 1-463 illus.

Rook, or Castle. In chess, 2-330.

EMPERORS OF ROME

27 B.C.-14 A.D. Augustus

14-37 A.D. Tiberius

37-41 Caligula

41-54 Claudius

54-68 Nero

68-69 Galba

69 Otho

69 Vitellius

69-79 Vespasian

79-81 Titus

81-96 Domitian

96-98 Nerva

98-117 Trajan

117-138 Hadrian

138-161 Antoninus Pius

161-180 Marcus Aurelius

180-192 Commodus

193 Pertinax

193 Didius Julianus

193-211 Septimius Severus

211-217 Caracalla

217 Macrinus

218-235 Heliogabalus (Elagabalus)

235-238 Alexander Severus

238-238 Maximinus

238 Gordian I

238 Gordian II

238 Pupienus

238 Balbinus

238-244 Gordian III

244-249 Philip the Arabian

249-251 Decius

251-253 Gallus

253 Aemilian

253-260 Valerian

253-268 Gallienus

268-270 Claudius

270-275 Aurelian

275 Tacitus

276-288 Probus

282-283 Carus

284 Carinus

284-305 Numerianus

284-305 Diocletian

286-305 Maximianus

305-306 Constantius Chlorus

(West)

305-311 Galerius (East)

306-312 Maxentius (West)

306-337 Constantine the

Great (West, later all)

307-323 Licinius (East)

337-361 Constantius (East, later all)

337-340 Constantine II

(West)

337-350 Constans (Africa)

361-363 Julian

363-364 Jovianus

364-375 Valentinian I (West)

364-375 Valens (East)

375-383 Gratian

375-392 Valentinian II

(jointly)

379-395 Theodosius I (East, later all)

WESTERN EMPIRE

395-423 Honorius

423-455 Valentinian III

455 Maximus

455-456 Avitus

457-461 Majorian

461-465 Libius Severus

465-467 Ricimer (emperor-maker)

467-473 Anthemius

473 Olybrius

473 Glycerius

473-475 Julius Nepos

475-476 Romulus Augustulus

ROOSEVELT

Roosevelt, Franklin Delano (1882-1945). Amer. statesman; four times elected Pres. of U.S.A., 6-440; and Atlantic Charter, 7-364; Lease-Lend, 4-465; with Churchill, 2-385 illus. 1; death, 7-321.

Roosevelt, Theodore (1858-1919). 26th pres. of U.S.A., 1901-09.

Roosevelt Dam, near Phoenix, Arizona U.S.A., on Salt r., 1-239.

Root, of plants, 6-451; division of garden plants, 3-501; root pressure, 6-210; of trees, 7-313; of water-plants, 7-429, 430.

Root Crops, in crop rotation, 1-78.

Roots, in maths., 6-474.

Rope, 6-451; hemp, 4-161; jute, 4-389; sisal, 7-58; string, 7-173.

Ropewalk, shed or alley where rope is made, 6-451, 453 illus.

Rops (rôps), Félicien (1833-98). Belgian illustrator and etcher, whose work, though sometimes too decadent and cynical to be pleasing, is almost unique in power of execution.

Rosfort, Type of soft cheese made from ewes' milk, 2-315.

Rorke's Drift, Natal, S. Africa. On Tugela r., the scene of a gallant stand by a small Brit. force under Lieut. Chard and Bromhead against some 4,000 Zulus, Jan. 22, 1879, following the Isandlwana disaster; the Zulus failed in their attack and withdrew; 7-527.

Rorqual, A whale, 7-445, 446 illus.

Rosa, Carl (1812-89). Ger. operatic impresario, who came to Eng. and founded the Carl Rosa Opera Company, which familiarized the public of Gr. Britain with opera in English.

Rosa, Salvator (1615-73). It. painter, chief master of Neapolitan school, wild and romantic in life and art; 4-320.

Rosales [rôzâ'lez]. The rose order, including roses, "pitted" fruits, apples, and the bean family.

Rosalind, Heroine of Shakespeare's *As You Like It*, 1-285.

Rosamond, Fair. In Eng. legend, beloved of King Henry II, hidden away by him in a bower at heart of a labyrinth in Woodstock; found by jealous Queen Eleanor and forced to drink poison.

Rosario [rô'sârîô]. The 2nd city of Argentina, rly. centre and port on Par. nat., 211 m. above Buenos Aires; pop., 61,658; large foreign trade.

Rosas [rô'sâhs], Juan Manuel (1793-1877). Argentine dictator (1835-52); cruel despot; overthrown by combination of foreign and domestic enemies, 1-226.

Roseco, Sir Henry (1833-1915). Brit. chemist, prof. at Manchester univ.; M.P., 1885-95; author of textbooks; and Bunsen, 2-124.

Rosecommon. Inland co. of Irish Rep.; area 951 sq. m.; pop. 74,000. Stock raising and agriculture chief occupations; iron and coal mined. Co. tn. Rosecommon.

Rose, Flower, 6-453; essential oil for perfumes, 6-125; cuttings, 3-504.

Rose-bay Willow, herb, 7-455.

Rosebery, Archibald Philip Primrose, 5th Earl of (1847-1929). British Liberal statesman, orator, and writer; premier in 1894-95, and long thereafter a power in politics, though he held no office; wrote biographies of Pitt, Peel, Cromwell, Napoleon. Won the Derby three times (in 1894, 1895, and 1905).

Rose-shafer. Beetle, *Celonis aurata*, closely related to the cockchafer, bright bronze-green all over, often found in roses whose petals it eats. 1 rya lives in soil for several years. 1-114.

Rose Diamond. Circular diamond cut with small facets to suggest a rose.

Rosenkavalier, Der. Opera by Richard Strauss; story, 6-520.

Rose Noble. Gold coin issued by Edward III in 1344, 6-235.

Rose of Jericho. Plant of Syria and N. Africa; after the fruits are formed it dries up, becomes detached from ground, the stems curve inward, and

the plant is rolled by the wind like a ball to a moist place, where it opens again and discharges its seeds.

Rose of Sharon. Name given to an ornamental shrub (*Hibiscus syriacus*), and also to the Great St. John's Wort, *Hypericum calycinum*, popular in English gardens for its big, bright yellow flowers. Biblical rose of Sharon was probably a kind of narcissus.

Roses, Wars of the. Contest between rival houses of York and Lancaster for Eng. throne, 1455-85, 6-453; Edward IV and, 3-167; Henry VI and, 4-163; battle of Bosworth Field, 2-23.

Rose's Metal, 1-475.

Rosetta [rôzê'ta]. Eg. tn. on Rosetta mouth of Nile r.; pop. 28,700; formerly of commercial importance; Rosetta Stone found near by; 3-173, 5-440.

Rosetta Stone. Inscribed black basalt slab discovered 1799, 6-454; as key to Egyptian inscriptions, 3-183, 3-203 illus.

Rose Window. See Architectural Terms.

Rosewood. Hard, close-grained, fragrant wood of Brazilian tree of the pea family; prized in cabinet-making.

Rosierucians [rôzîrûô'shânz]. Ger. society said to have been founded by a monk named Rosencreutz in the middle of the 15th cent.; it was supposed to be a secret society, whose members were said to possess the secrets of alchemy. A modern Rosierucian Order, known as "The Ancient Mystical Order Rosae Crucis" throughout the world, is a non-sectarian fraternity; its h.q. is in San José, California, U.S.A.

Rosin. Purified form of the resin distilled from turpentine; uses, 6-389, 7-30.

Rosinante [rôzînan'te]. Don Quixote's famous raw-boned steed, 2-295.

Roskilde. See Roskilde.

Ross, Sir James Clark (1800-62). Brit. sailor and polar explorer; nephew of Sir John Ross; 6-242, 244.

Ross, Sir John (1777-1856). Brit. sailor and Arctic explorer, uncle of Sir James Ross; wrote an account of his 1829-33 expedition, *Narrative of a Second Voyage in Search of a North-West Passage*; commanded an expedition in search of Sir John Franklin in 1850.

Ross, Sir Ronald (1857-1932). Brit. physician, discoverer of life-history of malaria parasite in mosquitoes; Nobel prize for medicine (1902), 5-93, 5-165.

Ross and Cromarty. Co. of Scot. 4 areas, 3,089 sq. m.; pop. 60,503; co. tn. Dingwall; 6-455.

Rossbach [rô'sbahk]. Ger. vil. 25 m. w. of Leipzig; battle (1757), 7-3.

Ross Dependency. Antarctica; admin. by New Zealand, 1-169, 5-427.

Rossetti, Christina Georgina (1830-94). Sister of Dante Gabriel Rossetti; a lyric poet of distinction; excelled in religious and mystical verse ("Goblin Market"; "A Paganini").

Rossetti, Dante Gabriel (1828-82). Brit. painter and poet ("The Blessed Damsel"); leading spirit of Pre-Raphaelite Brotherhood, 6-285, 3-261.

Ross Ice Barrier, Antarctica; route to S. Pole, 1-164.

Rossini [rôssî'nô], Gioacchino Antonio (1792-1868). It. operatic composer (*The Barber of Seville*; *William Tell*; *Stabat Mater*; music of ballet, *La Boutique Fantastique*); 5-514, 516, 7-255.

Rossire, Co. Wexford, Irish Repub.; harbour for chipping plying to and from Fishguard.

Ross Sea, Antarctica, 6-244; sunken plateau, 1-163.

Ross Seal, in Antarctica, 1-169.

Rostand [rôstahn'], Edmond (1868-1918). Fr. dramatist; wrote (*Cyrano de Bergerac* and *Châleir*).

Rostock, Ger. Largest city of Rostock dist. and one of chief Baltic ports; pop., including Warnemünde, 122,400; univ.; an old Hanse tn.

ROUAULT

Rosov-on-Don. Commercial centre of R.S.F.S.R., 20 m. from Sea of Azov; pop. 510,000; grain, flour, iron, annual fair; heavy fighting in 2nd World War, 7-191, 493.

Rosyth [rô'sh'th]. Naval base and dockyard in Fife, on Firth of Forth Scot.; constructed 1909-16.

Rotary Excavator, for tunnelling, 7-326.

Rotary International. Organization which seeks to found all business transactions on a basis of service, peace and good fellowship. First Rotary Club started in America in 1905; called "rotary" because meetings were held in rotation at different members' houses.

Rotation of Crops. See Crop Rotation.

Rothenslein, Sir William (1872-1915). Brit. artist, notable for portrait drawings of eminent contemporaries; principal of the Royal Coll. of Art 1920-35; 4-252 illus.; 4-371 illus. His son, Sir John Rothenslein (b. 1901), a writer on art, became in 1938 director of the Tate Gallery.

Rother. Name of 3 rs. in Eng.; (1) flowing 21 m. through Derbyshire and Yorkshire, where it joins the Don; (2) flowing 31 m. through Sussex and Kent to the Eng. Channel; (3) a 24-m. trib. of the Arun, flowing through Hants and Sussex.

Rotherham. Mfg. tn. 6 m. N.E. of Sheffield at junction of R. Rother with r. Don; pop. 82,331; iron and steel product glass, pottery.

Rotherham plough, agricultural implement, 6-225, 221 illus.

Rotherhithe Tunnel, London. Deep cutting 1 m. 440 yds. long, of which 1,530 ft. is beneath the Thames; opened in 1908. It connects Union Road, Rotherhithe, with Commercial Road, Stepney; also another from Rotherhithe to Wapping completed 1813, used by rly., 2-09, 7-325, 26.

Rothemere, Harold Harmsworth, 1st Viscount (1868-1914). Brit. news paper proprietor, younger brother of Viscount Northcliffe; first dir. minister 1917; endowed chairs of Eng. Lit. and Naval Hist. at Cambridge and of American Hist. at Oxford, 6-457.

Roths. Tn. of Morayshire, Scot.; pop. 1,211; 5-261.

Rothsay. Co. tn. of Buteshire, Scot., on the isle of But; pop. 10,145; 2-134.

Rothschild. Family of Jewish financiers founded by Mayer Anselm Rothschild (1713-1812); 4-373. In his charge the director of Hesse Cassel, fleeing from Fr. Rev. armies, left his treasures. His third son, Baron Nathan Mayer (1777-1846) was head of the firm's London branch and founder of its unique international greatness; he staked all on Napoleon's overthrow and financed Brit. govt. in crisis of 1813.

Roulfers. The microscopic "wheel animals," so called by reason of the peculiar wheel-like "flia" used for locomotion; commonly found in ponds; there are some marine species.

Rotodyne. Name of type of helicopter, 4-159.

Rotor. Horizontal propeller of helicopter, 4-157; also free-revolving blade of the *Autogiro*; 1-326.

Rotorua. Town and health centre of the North Island, New Zealand. Noted for its geysers and hot and cold lakes; has sanatoria and medicinal baths; pop. 7,500.

Rotten Boroughs, in Eng. politics; abolition in 1832, 6-88.

Rotten Row. Track in Hyde Park, London, reserved for horse riders. Name said to be a corruption of "Route du Roi" (The King's Way).

Rotterdam. Second largest city and chief port of the Netherlands; pop. 684,658; 6-455, 5-370.

Rouault [rô'bô], Georges (b. 1871). Fr. painter; apprenticed to painter of stained glass, with effect on the style and colour of his paintings, which show great power; of Expressionist school; 3-449.

ROUBAIX

Roubaix [ʁubɛs']. Fr. mfg. tn. in N. near Belgian border; pop. 101,000; woollen and linen goods, carpets; 3-433.

Rouble [ʁubl]. Russ. monetary unit, formerly gold; it consists of 100 kopecks.

Rouen. Cath. city and river port of Fr.; pop. 107,739; 6-456, 3-138, 5-419.

Rouget de Lisle, Claude Joseph (1760-1836). Fr. soldier, composer of the *Marseillaise*. Fr. national anthem, 5-326 illus.

Round or Canon. Musical composition for a number of voices; "Summer Is Icomen In," 5-304.

Roundsabout. Horizontal revolving wheel on which people ride at fairs/grounds, 3-337.

Roundels. In heraldry, 4-161 illus. f.

Round Table. In Arthurian legend, 6-456, 1-256; and the Siege Perilous, 4-51; stories, 6-457.

Round Worm. Animal parasite, 7-500.

Rousseau, Henri (1814-1910). Fr. painter, called "Le Douanier," from his job as Paris toll-house keeper. Self-laught; childish outlook, but brilliant sense of form and colour.

Rousseau, Jean Jacques (1712-78). Fr. philosopher, 6-459, 3-455, 6-160; influence on Robespierre, 6-115.

Rousseau, Théodore (1812-67). Fr. painter, a leader of Barbizon school, 3-440; Sunset at Fontainebleau, 3-440 illus.

Rove-beetle. Beetle of family *Staphylinidae*. See Devil's Coach-horse.

Rove Tunnel for sea-going barges, s. of Fr., 7-326 illus.

Roving, in cotton mfr., 2-520.

Rowallan, Thomas Godfrey Polson Corbett, 2nd Baron (b. 1895). Chief Scout from 1915, 2-37.

Rowan Tree, or Mountain Ash, 1-263.

Rowe, Nicholas (1673-1718). Eng. poet and dramatist; pub. edition of Shakespeare's plays, 7-15; poet laureate (1715-18), 6-232.

Rowing, 6-459.

Rowlandson, Thomas (1756-1827). Brit. artist whose work included landscapes, portraits, and (most notably) humorous caricatures, 3-273.

Rowley Poems, The. Literary forgeries by Thos. Chatterton, 2-310.

Rows, The, Chester, Eng., 2-331.

Rowtqn Houses. Buildings providing cheap lodgings for poor men founded (1892) by Lord Rowton (1838-1903). There are 6 houses in London.

Roxburghshire. Co. of Scot.; area 666 sq. m.; pop. 15,562; co. tn. Jedburgh, 6-460.

Royal Academy of Arts, Burlington House, Piccadilly, London. Founded in 1768 "for the purpose of cultivating and improving the arts of painting, sculpture, and architecture," 1-9, 3-258; early exhibition, 6-36 illus.; Reynolds and, 6-390; and Eng. art, 3-262, 263; art schools 5-28.

Royal Academy of Dramatic Art, London. Founded (1904) by Sh Herbert Beerbohm Tree, 1-9, 5-28.

Royal Academy of Music, York Gate, Marylebone Rd., London. Originally founded in 1822, exists for instructing pupils in music. Successful students may take Licentiate's, Associate's, or Fellow's diploma, (J.L.R.A.M., A.R.A.M., F.R.A.M.), 1-9, 5-28.

Royal Air Force, 6-460; anti-submarine warfare, 1-294; Battle of Britain, 2-76, 79; bombing in 1st and 2nd World Wars, 1-511, 514; cadets, 2-159; careers in, 2-240; colours, 2-468; origin, 3-385; parachute, 6-73; early passenger services, 1-85; use of personal armour, 1-244; use of radar in 2nd World War, 6-337; roundel, 6-462; slang, 7-65.

Royal Air Force Regiment, duties, 6-463.

Royal Air Force Volunteer Reserve (R.A.F.V.R.), 6-463.

Royal Albert Hall. See Albert Hall, Royal.

Royal and Ancient Golf Club. See St. Andrews.

Royal Armoured Corps. Formed 1935 by amalgamating mechanised cavalry regiments and the Royal Tank Corps, 1-250, 7-225 illus.

Royal Army Catering Corps, 1-252.

Royal Army Medical Corps, 1-252.

Royal Army Ordnance Corps, 1-252.

Royal Army Pay Corps, 1-252.

Royal Army Service Corps, 1-252.

Royal Artillery. See Royal Regiment of Artillery.

Royal Astronomical Society. Brit. society, founded in 1820; Sir William Herschel was the first pres.; granted Royal Charter by William IV in 1831; h.q. at Burlington House, Piccadilly, London.

Royal Automobile Club (R.A.C.). Club founded in 1897 to further the interests of the motorist.

Royal Auxiliary Air Force (R.A.A.F.), 6-463.

Royal Canadian Mounted Police (R.C.M.P.), "the Mounties." Were formerly known as the Royal N.W. Mounted Police; with h.q. at Ottawa, responsible for maintaining order, esp. in remote parts of Canada 2-201, 6-253 illus.

Royal College of Art, S. Kensington, London; founded in 1837; Associate's diploma (A.R.C.A.) is awarded to successful students, 5-28.

ROYAL FESTIVAL HALL

Royal College of Music, S. Kensington, London. Founded in 1882; incorporated by Royal Charter in 1883; present building erected in 1891. Successful students at the college may sit for the diploma, A.R.C.M.

Royal College of Organists, S. Kensington, London, founded in 1861. Awards diplomas of Associateship (A.R.C.O.) and Fellowship (F.R.C.O.) and Diploma (C.H.M.), 5-28.

Royal Company of Archers, Scottish society, oldest archery group in Great Britain (1676), 1-207.

Royal Corps of Military Police, 1-252.

Royal Electrical and Mechanical Engineers (R.E.M.E.), 1-252.

Royal Engineers (R.E.), 1-250, 5-218.

Royal Exchange. London building between Threadneedle Street and Cornhill; third on the present site first, founded by Sir Thomas Gresham, opened 1566, destroyed by Great Fire (1666); second, opened 1669, burnt 1838; present building opened 1811; 1-363, 5-20; old h.q. of Lloyd's, 4-532.

Royal Family, 6-463; as art collection, 2-154.

Royal Festival Hall, London. Built in 1951 with seating capacity for 3,000 specially designed for musical performances, 1-219, 5-24

' THE BRITISH ROYAL FAMILY

	The Sovereign	Born
Her Majesty Queen Elizabeth II	Succeeded her father, King George VI, Feb. 6, 1952	Apr. 21, 1926
Married, Nov. 20, 1947, Prince Philip, Duke of Edinburgh, b. June 10, 1921, and has issue:—		
Prince Charles Philip Arthur George (Duke of Cornwall)		Nov. 14, 1948
Princess Anne Elizabeth Alice Louise		Aug. 1, 1950
Her Majesty Queen Elizabeth the Queen Mother	Married April 26, 1923 (as Lady Elizabeth Bowes-Lyon)	Aug. 4, 1900
Prince Albert, Duke of York, who succeeded as King George VI, Dec. 11, 1936		
Princess Margaret Rose		Aug. 21, 1930
Prince Edward Albert Christian George Andrew Patrick David (Duke of Windsor)	Succeeded his father, King George V, Jan. 20, 1936	June 23, 1894
abdicated Dec. 11, 1936		
Married, June 3, 1937, Mrs. Wallis Warfield		
Prince Henry William Frederick Albert (Duke of Gloucester)	Married, Nov. 6, 1935, Lady Alice Montagu-Douglas-Scott, b. Dec. 25, 1901, 3rd daughter of 7th Duke of Buccleuch	Mar. 31, 1900
has issue:—		
Prince William Henry Andrew Frederick		Dec. 14, 1941
Prince Richard Alexander Walter George		Aug. 26, 1944
Princess Marina (Duchess of Kent)		Dec. 13, 1906
Youngest daughter of late Prince Nicolas of Greece		
Married, Nov. 29, 1934, Prince George Edward Alexander Edmund (Duke of Kent), b. Dec. 20, 1902; died Aug. 25, 1942, and left issue:—		
Prince Edward George Nicholas Patrick (Duke of Kent)		Oct. 9, 1935
Princess Alexandra Helen Elizabeth Olga Christabel		Dec. 25, 1936
Prince Michael George Charles Franklin		July 4, 1942
Princess Victoria Alexandra Alice Mary (Princess Royal)	Married, Feb. 28, 1922, Viscount Lascelles (6th Earl of Harewood, d. May 21, 1947), and has issue:—	Apr. 25, 1897
George Henry Hubert (7th Earl of Harewood)		Feb. 7, 1923
Hon. Gerald David Lascelles		Aug. 21, 1924
Princess Marie Louise		Aug. 12, 1872
Daughter of Princess Helena, granddtr. of Queen Victoria		
Princess Alice, Countess of Athlone	Daughter of Prince Leopold, granddaughter of Queen Victoria. Married Feb. 10, 1904, Earl of Athlone (brother of Queen Mary).	Feb. 25, 1883
Princess Patricia of Connaught (Lady Patricia Ramsay)	Daughter of Duke of Connaught. Married, Feb. 27, 1919, Admiral Sir Alexander Ramsay.	Mar. 17, 1886
Princess Arthur of Connaught (Duchess of Fife)	Daughter of Princess Louise and Duke of Fife. Married Oct., 1913, Prince Arthur of Connaught (d. Sept. 12, 1938).	May 17, 1891
Earl Mountbatten of Burma	2nd son of 1st Marquess of Milford Haven, great-grandson of Queen Victoria. Married, July 1922, Edwina Cynthia Annette Ashley.	June 25, 1900

ROYAL FLYING CORPS

Royal Flying Corps (R.F.C.), 6-460.
Royal Greenwich Observatory, Hurstmonceux. Official name of what was the Royal Observatory, Greenwich. Transfer to Hurstmonceux Castle began in 1946, 5-494.
Royal Horse Artillery, 1-250, 261.
Royal Holloway College, College of London Univ. (for women), near Egham, Surrey, founded 1886, 5-33.
Royal Hospital, Chelsea, and Oak Apple Day, 5-489.
Royal Humane Society. Founded in 1771 by Dr. William Hawes and Dr. Thomas Cogan for rendering first aid in cases of drowning; awards medals and certificates to persons saving life; the h.q. of the society is at York Bldgs., London, W.C.2.
Royal Institution of Great Britain. Scientific institution founded in 1799 and chartered in 1800 to further research and spread knowledge.
Royal Jelly. Food for queen bees, produced by worker bees, 1-103.
Royal Marines; careers, 2-210; colours, 2-466; ranks, 5-357.
Royal Meteorological Society. Founded in London (1850); incorporated under Royal Charter (1866); promotes the study of the weather and regular recording of observations; Fellows are elected by ballot.
Royal Military Academy (R.M.A.), Sandhurst, Berks.; formed 1947 by combining former R.M.A. at Woolwich with R.M.C., Sandhurst, 1-9.
Royal Military College (R.M.C.), Sandhurst, became in 1917 part of Royal Military Academy, Sandhurst.
Royal National Life-boat Institution (R.N.L.I.), Founded in 1821 to maintain lifeboats around U.K. coasts; dependent upon voluntary contributions, 4-493.
Royal Naval Air Service, 6-460; amalgamated with Royal Flying Corps, 6-462.
Royal Naval College, Dartmouth. Founded in 1905 to train cadets for Royal Navy commissions; renamed Britannia R.N. College, Dartmouth, 1933 5-355.
Royal Naval College, Greenwich, founded in 1873; here Brit. naval officers study for their higher professional examinations.
Royal Naval Reserve. Component of the Royal Navy established 1861; recruited from officers and ratings of the Merchant Navy, 5-357.
Royal Naval Volunteer Reserve. The "territorial" branch of the Navy, 5-357.
Royal Navy. See Navy.
Royal Niger Company. Founded 1886 to take over interests of the National Africa Co. in Niger valley; surrendered its charter to Brit. govt. 1899; foundation of Brit. influence, 5-436.
Royal Observer Corps, duties, 6-463.
Royal Opera House, Covent Garden, London, 7-266.
Royal Regiment of Artillery, 1-250, 1-260.
Royal Red Cross (R.R.C.) founded in 1883; British order conferred on ladies, usually nurses, for acts of mercy and bravery in tending sick or wounded soldiers, sailors, or airmen in time of war.
Royal Scots. British Army regiment. Known as "the premier regiment of the line." Is descended from Sir John Hepburn's regiment, raised in Scotland in 1572. Its long history is responsible for its sobriquet "Pontius Pilate's Bodyguard."
Royal Signals, 1-252.
Royal Society, The. Oldest scientific society in Gt. Brit., 6-463; foundation, 5-162; Charles II and, 2-307; Wren and, 7-501.
Royal Sovereign. Brit. battleship at Trafalgar, 7-305.
Royal Standard. May be hoisted only over a building or on a ship or vehicle in which the sovereign is actually present, 3-385, 384 illus.
Royal Tank Corps (R.T.C.). See under Royal Armoured Corps.

Royal Tournament. Spectacular armed services pageant, held annually at Olympia, London.
Royal Toxophilite Society. Archery society, founded 1781, 1-207.
Royal Victorian Order. Order of knighthood, 5-530, 4-418.
Royce, Sir (Frederick) Henry (1863-1933). Brit. engineer. His first motor-car built in 1901; he joined forces with Hqn. C. S. Rolls, to found the Rolls-Royce Co.
Rozier, J. F. P. de. See *Pilâtre de Rozier*.
R.S.F.S.R. (Russian Soviet Federal Socialist Republic). See Russia.
Ruapehu. Active volcano on N. Island, New Zealand (9,175 ft.), 5-422.
Rubáiyát of Omar Khayyám, Fitz-gerald's translation, 5-511.
Rub-al-Khali. Desert in Arabia; first crossed by Bertram Thomas (1930-31), 1-190, 190.
Rubber, 6-464; cutting rubber tree, 1-48 illus.; production in Brazil, 2-46; production in Indonesia, 4-257; Malayan plantations, 5-91; molecules, 6-466; synthetic rubber, 1-10.
Rubbra, Edmund (b. 1901). Brit. composer, pianist, and music critic; five symphonies, *Sinfonia Concertante* (piano and orchestra), *The Dark Night of the Soul* (choir and orchestra). Four Medieval Latin Lyrics (baritone and orchestra). *The Buddha* (flute, oboe, and string trio).
Rubens, Peter Paul (1577-1640). Flemish painter, 6-468, 5-381; and Jan Brueghel, 2-97; influenced by Italians, 6-34; paintings in Antwerp, 1-179; Adam and Eve, 1-15 illus.; Dance of Peasants, 5-387 illus.; Xavier Preaching, 7-506 illus.
Rubiaceae. Family of plants, which includes coffee, madder, cinchona (Peruvian bark) and gardenia.
Rubicon. Anc. name of river emptying into Adriatic, 25 m. s. of Ravenna, formerly N.E. boundary of It.; Caesar's crossing, 2-162.
Rubidium (Rb). Chem. element; atomic no. 37; atomic weight 85.48; melting point 39° C.; 3-224, 5-177; hydroxide and carbonate, 1-112; weak radio-activity, 6-352.
Rubinstein, Anton Gregor (1829-94). Russian composer and pianist ("Melody in F").
Rubus. A genus of the rose family; includes blackberry, loganberry, and raspberry.
Ruby. Precious stone, 7-165, 166.
Ruby-throat humming bird, 4-203.
Ruby wasp. Insect, 4-265 illus.
Rudd, A coarse fish, 6-104.
Rudder, in aeroplane, 1-10, 39 diag.
Rudolf, Lake, in Brit. E. Africa and Abyssinia, N.E. of Lake Victoria.
Rudolph I of Hapsburg (1218-91). Ger. king and Holy Roman emperor (1273-91); founder of Imperial House of Austria, 4-7.
Rue. A herb with bitter leaves, formerly used in medicine; also used in magic rites.
Ruff, wading bird; female known as a Reeve.
Ruff. Wide collar of pleated linen fashionable in 16th cent., 2-421.
Rufus, William. See William II of England.
Rugby. Tn. in Warwickshire, on r. Avon; pop. 45,418; famous public school, founded in 1567 (see Arnold, Thomas). Near Rugby is beam radio transmitting station; 7-420.
Rugby football (rugger); origin of, 3-415.
Rugby League football, 3-417.
Rugby Union football, 3-415, 416.
Rügen. German isl. in Baltic, N. of Pomerania; in Russian zone of occup. in Ger. after 2nd World War; area 373 sq. m.; pop. 54,000; cap. Bergen.
Rugs. See Carpets and Rugs.
Ruhr. Industrial region of w. Germany, on either side of the r. Ruhr, 6-468, 4-1, 4; French occupation, 4-9, 3-317, 7-485.

RUSHES

Ruhr. R. of Ger., rising in the Winterberg, flowing w. 145 m. to join the Rhine at Duisburg-Hamborn. Gives name to the Ruhr basin, 6-468, 6-390.
Ruisdael, Jacob van (1625-82). Dutch landscape painter, 5-381.
Ruiz (roo'ee). J. José Martínez or Azorin (b. 1874). Sp. writer, 7-122.
Ruiz de Alarcón, Juan (c. 1581-1639). Mexican poet.
"Rule of Three." See Proportion.
Rum (Hebrides). See Rhum.
Rum. A spirit distilled from fermented cane sugar, 7-136.
Rumania. Republic of s.e. Europe; area 88,715 sq. m.; pop. 15,872,621; cap. Bucharest, 6-469; lang. 3-384 illus. f.; language, 4-119, 6-127; characteristics of people, 6-170; in 1st World War, 7-480; in 2nd World War, 7-490, 496.
Rumelia. Name of former Turkish lands in Balkans; esp. cent. Albania and w. Macedonia; E. Rumelia, autonomous prov. 1878; united with Bulgaria in 1885.
Rumford, Benjamin Thompson, Count (1753-1814). Amer. scientist, soldier, and political adventurer; work on heat and energy, 4-115, 3-245.
Ruminants. Cloven-hoofed mammals which chew the cud, 6-471, 2-273.
Rump Parliament in Eng. history; Cromwell and, 2-534.
Rumsey, James (1743-92). Amer. engineer; work on hydraulic jet propulsion, 4-371.
Rundstedt (round'shtet), Karl R. G. von (1875-1953). Ger. soldier; 1938 organized invasion of Sudetenland; took Warsaw, Sept. 1939; in 1940 made F.-M. for breaking Fr. lines in Ardennes and on Meuse; defeated at Moscow 1940, transferred to supreme command on W. Front, 1912-11; counter-attacked in Ardennes, Dec. 1944; relieved of command, March 1945; captured by Brit. in May and interned in Wales; repatriated to Ger. 1949, where he was judged unfit to stand trial.
R Unit. Abbreviation for Röntgen unit, the international unit of quantity, or dose, of X-rays (a.r.) or gamma rays. It is the amount of gamma radiation which will produce ions carrying one electrostatic unit of electricity of either sign per cubic centimetre of air.
Runner Bean, 1-390.
Running. In athletics, 1-290, 292.
Running. In sewing, 7-6.
Running Knot. See Slip Knot.
Running Rigging. See Nautical Terms.
Runnymede, or Runnimede. Plain in Surrey, on s. bank of Thames, 20 m. s.w. of London; Magna Carta sealed, 5-80, 4-378, 3-277 illus. f.
Run Rig System. See Rig.
Runswick Bay. Picturesque fishing vill. and holiday resort in N. Riding, Yorks., 3-252 illus.
Runyon, Damon (1884-1916). American short-story writer, 7-366.
Rupees (rūpē). Coin of India, and Pakistan; consists of 16 annas.
Rupert (Rupprecht) of Bavaria, Prince (1619-82). Nephew of Charles I of Eng.; commanded Royalist cavalry in Civil War; obtained charter for Hudson's Bay Co., 4-200; introduction of engraving, 3-298.
Rupert's Land. Former name of large territory around Hudson Bay, Canada, named after Prince Rupert, now called Saskatchewan.
Rupiah. See Money (Ind.).
Rural District. Unit of local govt. in Eng. and Wales, 4-52.
Rurik (d. 879). Varangian chieftain; became ruler of Russia c. 860; 6-473.
Rushcliffe, Henry B. Betterton, 1st Baron (1872-1949). Brit. politician; chm. of cttee. which produced in 1943 the Rushcliffe scale of salaries for nurses and midwives.
Rushes. Plants of the family *Juncaceae*, of the lily order; leaves grass-like, flowers usually small, dull, and inconspicuous; found principally in marshes or acid moorlands.

RUSK

Rusk. Bread or cake crisped in oven.
Ruskin, John (1819-1900). Brit. art critic and moralist, 6-471, 8-291; and Pre-Raphaelites, 6-285; and Lake dist., 4-439; *King of the Golden River*, 2-354.

Russell, Bertrand Arthur William Russell, 3rd Earl (b. 1872). Brit. philosopher and mathematician; advanced thinker on social questions and political theorist; *The ABC of Atoms, Problems of Philosophy, On Education, History of Western Philosophy, Human Knowledge—its Scope and Limits*. O.M. in 1919, Nobel prize for literature 1950; 6-160.

Russell, George W. See "Æ."

Russell, Sir [Edward] John (b. 1872). Brit. agriculturist; director of Rothamsted Experimental Station 1912-43 and of Imp. Bureau of Soil Science 1928-43; chm. Agric. Sub-cter. of U.N.R.R.A., 1941-45; wrote much on soil chemistry and plant nutrition.

Russell, John Russell, 1st Earl (1792-1878). Brit. statesman (Whig); he introduced the Reform Bill of 1831 and was prime min. 1846-52 and 1865-66; his second Reform Bill of 1866 failed and he resigned the Liberal leadership to Gladstone.

Russell, Dr. Richard (1687-1759). Eng. physician; and popularity of bathing, 2-69, 1-384.

Russell, Lord William (1639-83). Eng. patriot; tried to exclude Rom. Catholic successor to Charles II; executed after mock trial as accomplice in Rye House plot.

Russell of Killowen, Charles Russell, Baron (1832-1900). Brit. lawyer and politician; in the Gladstone govts. of 1886 and 1892 he was attorney-general; defended Parnell in 1889; in 1894 appointed Lord Chief Justice.

Russell's Viper, a snake whose venom is used to cause blood to clot, 7-75.

Russia, the Union of Soviet Socialist Republics (U.S.S.R.), area 8,700,000 sq. m.; pop. about 195,000,000; cap. Moscow; 6-472; maps, 6-470, 472 illus. f.; flag, 3-384 illus. f.; agriculture and industry, 6-473; agricultural schemes in tundra, 1-261; copper production, 2-503; development of Asiatic resources, 1-272; settlements in Arctic Siberia, 1-222, 7-48; canals, 2-205; hydroelectric schemes, 4-217; importance

RULERS OF RUSSIA

HOUSE OF RURIK
1462-1505 Ivan III, the Great
1505-47 Vassil Ivanovitch
1547-84 Ivan IV, the Terrible
1584-98 Feodor Ivanovitch
1598-1605 Boris Godunov
1605-18 The Troublesome Times

HOUSE OF ROMANOFF
1613-45 Michael
1645-78 Alexis
1676-82 Feodor Alexievitch
1682-89 Ivan V
Peter the Great } jointly
1689-1725 Peter the Great (alone)
1725-27 Catherine I
1727-30 Peter II
1730-40 Anna Ivanovna
1740-41 Ivan VI
1741-61 Elizabeth
1762-73 Peter III
1762-98 Catherine II
1796-1801 Paul
1801-25 Alexander I
1825-55 Nicholas I
1855-81 Alexander II
1881-94 Alexander III
1894-1917 Nicholas II

SOVIET REPUBLIC

1917 A. F. Krensky
1917-22 V. I. Lenin

PREMIERS OF SOVIET UNION

1922-24 V. I. Lenin
1924-53 J. V. Stalin
1953-55 G. M. Malenkov
1955- N. A. Bulganin

of the r. Volga, 7-405; Russian plain, 3-310; slavery in Siberia, 7-66; Arctic territories, 6-246; Turkistan, 7-331; privileges in Manchuria, 5-112; government, 6-473; Kremlin, 6-473 illus. f.; ballet, 1-351; development of the cinema, 2-396; music in 19th cent., 5-306.

History, 6-473, 3-314; Ivan the Terrible, 4-331; conquest of Siberia, 1-270; Cossacks, 2-514; Peter the Gr., 6-145; Catherine II, 6-475, 5-500; Seven Years' War, 7-2; partition of Poland, 6-240; Napoleon's Russian campaign, 6-322; rule of Nicholas I, 5-431; and Persia in 19th cent., 6-132; Crimean War, 2-532, 1-481, 5-431; Russo-

RUTLAND

Turkish War, 3-93; Alaskan settlement and sale, 1-88, 90; annexation of Caucasus, 2-274; Russo-Japanese War, 4-350, 1-272; Nicholas II and the revolution, 5-432, 3-317, 6-474; Marx and Communism, 5-139; Lenin, 4-478; in 1st World War, 7-478; death of Tsar, 7-481; and League of Nations, 4-464; Stalin, 7-141; pact with Ger. (1939), 4-183; in 2nd World War, 7-490, 493, 496; war with Poland and Finland, 7-486, 3-355; and Europe, after 2nd World War, 3-310; and the Baltic states (Estonia, Latvia, Lithuania), 3-299, 4-453, 521, 6-474, 477, 478; atomic energy development, 1-301, 305.

Russia Leather. Type of leather, used in book-binding, 2-10, 4-468.

Russian Literature, 6-480; language 1-120, 5-239.

Russian Soviet Federal Socialist Republic. Largest and leading state of the U.S.S.R. Cap. Moscow; area 6,609,000 sq. m.; pop. about 110,000,000; 6-477.

Russian Turkestan, 7-331.

Russian Wolf-hound. See Borzoi.

Russo-Japanese War (1904-05), 4-300, 6-174.

Rust. Oxidized iron, 6-481; paint as protection against, 6-37; and zinc 7-523.

Rust Fungus. Various fungi parasitic on plants, 6-481.

Ruth, "Babe" (George Herman) (1895-1948). U.S. baseball player 1-378.

Ruthenia. Former Czech province ceded to U.S.S.R. in 1915, 4,900 sq. m.; pop. 3,800,000; 4-207, 3-21.

Ruthenium (Ru). Hard grey brittle metallic element of the palladium group; atomic no. 44; atomic weight 101.7; melting point, 2,500° 3-221.

Rutherford, Mark. Brit. novelist; real name Wm. Hale White (1831-1913) won fame with his autobiography.

Rutherford, Ernest Rutherford (1871-1937). Brit. physicist, 6-482; atomic experiments 1-299, 2-63, 6-352.

Ruthin (rith'in). Tn. in Denbighshire Wales; pop. 3,600; 3-17.

Rutile. An ore of titanium, 7-282.

Rutland. Smallest co. of Eng.; area 152 sq. m.; pop. 20,510; co. to Oakham; 6-482.

Rutland, Vermont. U.S.A., 2nd city of state, near centre, on Otter Creek

PRINCIPAL NAMES IN RUSSIAN LITERATURE

Leonid Andreyev (1870-1919), novelist, dramatist, and short story writer—"Judas Iscariot", "The Crushed Flower", "Silence and Other Stories".

Issac Babel (1894-), novelist and dramatist—"Stories of the Red Cavalry", "The Sunset".

Visarion Belinsky (1810-49), critic and essayist, writer of critical essays, and reviews.

Andrei Bely (Boris Bugaiev) (1880-1934), novelist and poet—"The Silver Dove", "Moscow", "Petersburg", "The Utn".

Alexander Blok (1880-1921), poet—"The Scythians", "The Twelve", "The Earth under snow", "The Hours of the Night".

Anton Chekhov (1860-1904), dramatist and short story writer—"The Seagull", "Peasants", "The Cherry Orchard".

Feodor Mikhailovich Dostoevsky (1822-81), psychological novelist—"Crime and Punishment", "The Idiot", "The Brother-Karamazov".

Feodor Gladkov (1883-), novelist—"Exile", "Cement Power".

Nikolai Gogol (1809-52), novelist and dramatist—"Taras Bulba", "Dead Souls".

Maxim Gorki (Alexei Peshkov) (1868-1936), novelist and short story writer—"Comrades", "Lords of Life", "On Guard for the Soviet Union".

Alexander Griboledov (1795-1820), dramatic satirist—"The Misfortune of Being Clever".

Valentine Kataev (1898-), novelist and dramatist—"Lonely White Sail", "Squaring the Circle".

Alexis Kolstov (1800-42), greatest Russian folk poet, author of numerous ballads, poems, and songs.

Mikhail Lermontov (1814-42), lyric poet and novelist—"The Demon", "On the Death of a Poet", "A Hero of Our Times".

Mikhail Lomonosov (1711-65), poet and grammarian, "father of Russian literature"—Ode on the Taking of Khotin.

Vladimir Mayakovsky (1893-1930), poet and dramatist—"The Cloud", "Left March", "Mystical Bouffe", "Lenin".

Alexander Ostrovski (1823-86), dramatist—"The Storm", "Wolves and Sheep".

Boris Pilnyak (1894-), novelist and short story writer—"The Naked Year", "Machines and Wolves", "Leather Jackets".

Alexander Pushkin (1799-1837), dramatist, novelist, and poet—"The Prisoner of the Caucasus", "Eugene Onegin", "Boris Godunov", "Queen of Spades".

Alexis Remizov (1877-), novelist—"The Pond", "The Clock", "The Fifth Postillion", "The Sisters of the Cross".

Lydia Selfullina (1889-), novelist and short story writer—"Virtue", "Humus".

Mikhail Sholokhov (1905-), novelist—"And Quiet Flows the Don".

Constantine Simonov (1918-), novelist, dramatist, poet and short story writer—"Days and Nights", "Russian People".

Alexis N. Tolstoy (1882-1944), novelist—"The Road to Calvary".

Alexis K. Tolstoy (1817-75), novelist, dramatist, poet—"The Childhood of Nikita", "Prince Serebrany", "Death of Ivan the Terrible".

Leo Tolstoy (1828-1910), novelist and philosopher—"War and Peace", "Anna Karenina", "The Kreutzer Sonata", "Master and Man".

Ivan Turgenev (1818-83), novelist—"A Sportsman's Sketches", "Fathers and Sons", "Virgin Soil".

Basil Zhukovski (1783-1852), critic and translator.

RUTTLEDGE



pop. 17,559; greatest marble industry in U.S.A.
Ruttledge, Hugh (b. 1894). Brit. mountaineer; Indian civil servant; leader of British Mt. Everest expeditions 1933 and 1936; 3-321.
Ruwenzori [roowenzō'ri]. Mt. group in Uganda Protectorate, E. cent. Africa, just N. of equator; highest point 16,800 ft.; 7-343; discovered by Stanley, 7-145.
Ruyter [roi'ter]. Michael Adriaanszoon de (1607-76). Dutch admiral; redoubtable adversary of Fr. and Eng., 5-42.
Ry'dal Water. Lake in Westmorland, Eng.; $\frac{1}{2}$ m. long, rather less in breadth, 4-439.
Ryde. Tn. of the Isle of Wight, con-

nected to Portsmouth and Southampton by steamer services; pop. 20,000.
Ryder Cup. Trophy held by the winners of golf professionals' competition between teams from (U. Brit. and U.S.A.); first held in 1927.
Rye. Anc. tn. in Sussex, on R. Rother, Cinque Port; trade in corn, wool, etc.; pop. 4,500; 2-402.
Rye. A cereal, 6-482.
Rye House Plot. Conspiracy (1683) by extreme opponents of R.C. succession to Brit. throne; plotted to kill Charles II and his brother, Duke of York, afterwards James II; excuse for execution of innocent political opponents including Algernon Sidney and Lord William Russell.

SAILOR'S KNOT

Rylands, John (1801-88). Brit. merchant; with father and brothers founder of one of the largest textile concerns in (U. Brit.). John Rylands Library, Manchester, erected to his memory by his wife.
Ry'mill, John Riddock (b. 1905). Australian polar explorer, in Greenland, in 1930-31 and 1932-33; led Brit. Graham Land expedition to Antarctic, 1934-37; 6-217.
Ryswick. Vil. near The Hague, Netherlands; Peace of Ryswick (1697), 7-452.
Ryukyu Islands. Chain of small isls. N.E. from Formosa to Kyushu, 941 sq. m. Formerly Jap.; occupied by U.S.A. 1945; Oshima (northernmost) group returned to Jap. 1953.

S

THERE was a time when the letter S looked more like our W. Turn the W on its side and cut off the bottom line and you get something that looks very much like our S. The story of S begins, in Egyptian picture-writing, with the hieroglyph , known as the "mundated garden," representing papyrus or lotus plants growing out of the water. When it came to be written in the Egyptian running hand like this , it

no longer looked like a garden, and the Phoenicians called it *shin*, which means "teeth." If you look closely, you can see the outline of the lower teeth, and the chin and beard as well. But the Phoenicians themselves made it *w*, like a squat W. The Greeks took it and, standing it on its side, made it into their letter Σ (*sigma*). Later the last stroke was omitted, and then, when the Romans had rounded the points, it became our familiar letter S.

Saale [zahr'ol]. R. of cent. Ger., flows S. 266 m. to r. Elbe.
Saar [zahr] Basin. Vast; of r. Saar in W. Ger. along Lorraine boundary; area 990 sq. m.; pop. 942,000; an immense coalfield, it has iron, steel, engineering, glass and pottery industries; after 1st World War administered by League of Nations; plebiscite decided its re-union with Germany Jan. 1935; autonomous state in economic union with France, 1917-56; part of Federal Germany from Jan. 1, 1957, French keeping mining rights 4-1, 7-184.
Saarbrücken [zahr'brēken]. City on r. Saar, 40 m. N.E. of Metz; pop. 145,000; cap. of Saar; first action in Franco-Prussian War, 3-158.
Sabaans. Religious sect in Iraq, 4-280.
Sabatynes. In armour, 1-244.
Sabbath, 6-483.
Sabi. R. of S. Africa; rising in Mashonaland, it drains the country between 'ntali and the Lundi r. Flows into Indian Ocean 30 m. S. of Chilone, 6-395; Birchenough Bridge, 1-65 illus.
Sabine. R. of U.S.A., flowing 500 m. to Gulf of Mexico, forming greater part of boundary between Texas and Louisiana.
Sabines [sahr'fanz]. An anc. people of cent. It., subdued by Romans 290 B.C.; 6-429.
Sable (*Mustela zibellina*). Small carnivorous mammal of the weasel family, resembling a marten, about 18 in. long. Fur is of great value. Formerly common in N. Asia, now found in E. Siberia; fur, 3-496. Sable marten is a N. Amer. species of marten, 5-138.
Sable Antelope. Species of antelope, 1-170 illus., 5-101 illus.
Sable fly, egg, 3-171 diag.
Sabot. Wooden shoe worn by poorer people in Belgium, Fr. and the Netherlands. Carved in one piece, usually from block of birch or beech wood. Patterns vary, 2-13; Dutch, 5-373 illus.
Sabotage [sahr'otahzh]. Fr. word denoting willful damage to plant, machinery, etc., by workpeople: either in industrial disputes, or for political reasons, e.g. in enemy-occupied countries, as in 1940-45.
Sabrata. One of three Rom. tns. in N. Africa from which Tripolitania,

"country of three cities," gets its name, 1-53.
Sabre, cavalry sword; as fencing weapon, 3-345.
Saccharine. An artificial sweetening substance, 7-186, 2-434.
Sacsohuaman. Ruined Inca fortress in Peru, 6-140 illus.
Sacheverell [sahr'ver'ell], **Dr. Henry** (c. 1674-1724). Eng. preacher, who created a sensation by his attack on Dissenters and the Whig party, for which he was brought before the House of Lords on a charge of high treason and suspended from preaching for 3 years; his sermons were publicly burned by the hangman.
Sachs [zahrks], **Hans** (1911-1976). Ger. shoemaker-poet, greatest of the mastersingers, ardent adherent of Luther; hero of Wagner's opera *Die Meistersinger*, 4-13, 5-476, 3-119.
Sackbut. Obsolete musical instrument ancestor of trombone, 7-322, 5-309.
Sackville-West, Victoria (b. 1892). Brit. poet and novelist; daughter of 3rd Baron Sackville; *The Edwardians* (1930); poetry includes *The Land*, (1927); *The Garden*, (1916).
Saco. R. of New Hampshire and Maine, U.S.A., length 175 m., 5-397.
Sacramento, California, U.S.A. State cap. and a leading mfg. city; on Sacramento r., 90 m. N.E. of San Francisco; pop. 137,572; 2-177.
Sacramento River, California, U.S.A. Rises on Mt. Shasta in N., flows 400 m. S. to Suisun Bay, 50 m. above San Francisco.
Sacraments, in Christian Church. Rites ordained as outward and visible signs of inward and spiritual grace; 2-380.
Sacré Coeur [sahr'kō]. Church at Montmartre in Paris, 6-84.
Sacred Wars. In Gk. history, series of wars waged (600-338 B.C.) in defence of Apollo's shrine at Delphi by members of Amphictyonic League.
Sacrifice, human, amongst Aztecs, 1-333.
Sacrum. Bone in human skeleton, 1-144 diag.
Saddleback (Mt.). See Blencathra.
Sad'ducees. Anc. Jewish sect, composed largely of the priestly aristocracy; opposed to Pharisees; rejected traditions of the elders, holding only to observances of the written law; and Jesus Christ, 4-364.

Sadler's Wells Theatre. London music hall in late 17th cent., rebuilt several times. Associated with Old Vic since present building was completed 1931; de Valois and ballet, 1-452.
Sadowa [sahr'dōvahl]. Czechoslovakia. Vil. 4 m. N.W. of Königgrätz; decisive engagement of Seven Weeks' War (1866), 4-8.
Saeters [sā'tez]. Mountain pastures of Norway.
Sale deposits, 6-184.
Sales and Strongrooms, 6-483.
Safety devices, on lifts, 4-195.
Safety-lamp, invention by Davy, 3-35, 54 illus.
Safety matches, 5-147.
Safety-pins, 6-203.
Saffron. A yellow colouring matter and drug obtained from crocus, 2-533.
Saffron Walden. Tn. in Essex, 14 m. N.E. of London; brewing; anc. remains; pop. 6,800.
Saga. Prose story of Icelandic literature esp. a prose epic governed by fixed rules of structure and style.
Sage. A plant of the mint family; dried leaves used as flavouring in cookery.
Sagger. Fireclay box in which pottery articles are fired, 6-274.
Saginaw, Michigan, U.S.A. Mfg. and trading city on Saginaw r.; pop. 92,352; centre of Michigan coal fields; glass, beet sugar, salt, lumber, iron and steel; 5-192.
Sagittarius [sahr'tārius] (the Archer), a sign of the zodiac, 7-524 illus.
Sagittate. Bot. term for an arrow-shaped type of leaf, 4-471.
Sago. Starchy foodstuff obtained from the sago palm, 6-484.
Sahara. Great desert region in N. Africa, area about 3,500,000 sq. m.; 6-484, 1-19, 3-78, 79 illus.
Saida, Lebanon. Tn. on W. Mediterranean coast, pop. 19,000; on site of anc. Sidon; 4-473.
Said Pasha (1822-63). Son of Mehmet Ali, Viceroy of Egypt; and de Lesseps, 3-176.
Saigon [sai'gon]. Port and trade centre of Vietnam, and cap. of Cochinchina s.e. Indo-China on r. Saigon, 35 m. from sea; pop. 1,179,000; 4-257, 256 illus.
Sailing charts, Mercator's projection used for, 5-119.
Sailing vessels, 7-28, 29; barge, 7-33 illus.
Sailor's Knot. See Reef Knot.

SAINFOIN

Sainfoin (*sainfoyn*). Perennial plant of the family *Leguminosae*, used in cent. and s. Eng. for hay or grazing. 2-24 illus. f.

St. Agnes. One of the Scilly Isles, 6-509.

St. Albans. City in Herts, Eng., 21 m. n.w. of London; pop. 11,106; 6-486, 4-172; cathedral, 2-268; pilgrims, 6-202; battles in Wars of Roses, 6-454, 4-173.

St. Andrews. Spt. and univ. city in Fifeshire, Scot.; pop. 9,159; 3 350; castle, 6 510; Royal and Ancient Golf Club, 4-41.

St. Andrews, University of. At St. Andrews, Scot.; co-ed.; founded in 1411; faculties of philosophy, law, medicine, theology; 3-135.

St. Anne's College, Oxford Univ.: foundation, 6-18.

St. Antony's College, Oxford Univ.: foundation, 6-18.

St. Austell. Market tn. in Cornwall, Eng.; pop. 23,634; china clay quarried; 2-508.

St. Bartholomew, Massacre of. Massacre of Huguenots beginning in Paris Aug. 24 (St. Bartholomew's Day) 1572; 3-450, 4 202; Coligny and, 2 463; painting by Millais, 4 201 illus.

St. Bartholomew's Hospital, London; founded 1123; popularly abbreviated to "Bart's"; 4-199. See also *Rahere*.

St. Bernard dog. Breed of large, intelligent dog, named from the hospice of the Great St. Bernard Pass, between Switz. and It., where these dogs were used by monks to find lost travellers, 3-101, 100 illus. f.; Alpine rescues, 1-126.

St. Bernard Pass, Great. Famous Alpine pass (8,110 ft.) between Switz and It., 1-126.

St. Bernard Pass, Little. Alpine pass in It. s. of Mont Blanc, 1-126.

St. Boniface. Tn. in Manitoba, Canada, on Red r. opposite Winnipeg; pop. 26,342; 5-115.

St. Brice's Church, Fleet St., London, designed by Sir Christopher Wren, 5-21 illus.

St. Catharine's College, Cambridge Univ., 2-182.

St. Catharine's Society, Oxford Univ., 6-38.

St. Christopher or St. Kitts. Mountainous isl. of Brit. W. Indies separated by narrow channel from Nevis; one of Leeward Is.; area 68 sq. m.; pop. 29,800.

St. Clair, Lake. N. Amer., on Michigan-Ontario border, between Lake Huron and Lake Erie, area 396 sq. m.

Saint-Cloud (*sanklud*). Fr. tn. 5 m. w. of Paris; pottery factories; Napoleon's palace.

St. Columb Major, Cornwall, Eng., type of football played, 3 111.

St. Croix. R. in Minnesota, U.S.A., trib. of the Mississippi, length, 200 m 5-222.

Saint-Cyr (*sanserl*). Fr. vil. n.w. of Versailles; famous for military school established (1806) in former convent. School transferred to Brittany after 2nd World War.

St. David's. Wales. Town n.w. of Pembrokeshire; cath. of St. Andrew and David completed in 1198.

St. David's Head. Wales. Sheer cliff (about 100 ft. high) 3 m. N.W. of St. David's; most westerly point of Wales.

Saint-Denis (*sandenl*). Fr. suburb of Paris on r. Seine; pop. 78,000; abbey church (12th cent.), burial place of early French kings; metal- and chemical industries.

St. Dunstan's. Training institute for the blind, Regent's Park, London; established for war-blinded persons, under supervision of Sir C. Arthur Pearson in 1915; maintained by voluntary contributions; tuition in various occupations; 1-488.

St. Anne de Beaupré. Vil. and pilgrim resort in Quebec on St. Lawrence r.; 20 m. below Quebec; pop. 1,927; famous shrine of St.

Anne, which thousands visit annually; church burned and rebuilt in 1922.

Sainte-Beuve (*santbäv*). Charles Augustin (1804-89). Fr. literary critic, exceptionally able and fair (*Crausette du Luvet*).

Sainte-Chapelle (*sant shapel*). Church in Paris, 6 83.

St. Edmund's Hall, Oxford Univ., 6-18.

St. Edward's Crown, in Brit. regalia, 2-538, 2-frontis; in coronation ceremony, 2-510 illus.

St. Elias, Mt. in Alaska. Snow-clad peak (18,024 ft.) in St. Elias Range, near Pacific coast, 325 m. N.W. of Sitka; Malaspina Glacier on s. slope; 1-88, 90.

Saint-Etienne. Fr. industrial city 3 m. s.w. of Lyons; pop. 178,000; near rich coalfields; firearms, iron products, silk; 3-434.

St. Eustatius or Eustache. Volcanic isl. in Netherlands Antilles; 7 sq. m.; pop. 1,403; chief tn., Orangetown; source of supplies for Continental army in War of Amer. Independence; captured by Brit. fleet (1781).

St. Francis River. A tributary of the Mississippi in s.e. Missouri and Arkansas, U.S.A.; 450 m. long, 1-239.

St. Gallen (Fr. *Saint-Gall*). Mfg. tn. in N.E. Switzerland, 10 m. E. of Zurich; pop. 63,947; embroideries, laces; famous monastery (from hermit St. Gall, 7th cent.) became centre of learning; celebrated library and former abbey church.

Saint-Gaudens, Augustus (1818-1907). Amer. sculptor, b. in Ireland; works include "Puritan" at Springfield, Massachusetts, and "Lincoln" at Chicago, a replica of which stands in Parliament Sq., London.

St. George's Channel. Strait 100 m. long and 60 to 100 m. wide, connecting Atlantic and Irish seas and separating Ire. from Wales, 4-281.

St. George's Chapel, Windsor Castle, Berks, 7-160 with illus. f.

Saint-Germain-en-Laye. Fr. summer resort on r. Seine, 11 m. w. of Paris; pop. 22,013; treaty between Allies and Austria signed here after 1st World War, 7-281.

St. Germans. Vill. of Cornwall, Eng.; almshouses, 1-118 illus.

St. Gotthard (*got'ahrd*). Group of Alps, Switzerland; highest points over 10,000 ft.

St. Gotthard Pass. Over Swiss-Italian Alps; long the chief route from N. Europe to Italy.

St. Gotthard Tunnel, Switz., 7-328, 7-215.

St. Heléna. Brit. volcanic isl. and colony in Atlantic, 1,200 m. w. of Africa; area 47 sq. m.; pop. 4,710; Napoleon was confined here from 1815 until his death, 1821, 5-323.

St. Helens. Tn. in Lancashire, 10 m. N.E. of Liverpool; pop. 110,276; chemicals, plate glass, copper products, bottles, patent medicines, coal trade; 4 114.

St. Helier. Cap. and port of Jersey, Channel Is.; pop. 25,360; 2-303.

St. Hilda's College, Oxford Univ., 6-14.

St. Hugh's College, Oxford Univ., 6-18.

St. Ives. Spt. and winter resort in Cornwall, 57 m. s.w. of Plymouth; pop. 9,027; favoured by artists; 2-508.

St. Ives. Tn. in Hunts, Eng., on r. Ouse; cattle trade; pop. 3,077; home of Oliver Cromwell, 4-210.

St. James's Palace, London. Original palace built in 1532, for Henry VIII. Much of it destroyed by fire in 1809. Though no longer the sovereign's official residence, foreign ambassadors and ministers are still accredited to the "Court of St. James's," and from the palace balcony each new sovereign is proclaimed; 5-26.

St. James's Park, London; area 93 acres; lake noted for waterfowl; 5-21, 25 illus.

St. Jean de Luz, France. Tn. and seaside resort in Bases-Pyrénées; has fisheries, 6-311.

Saint John, New Brunswick, Canada; pop. 50,779; 6-486, 5-394, 2-195

ST. MARY-LE-BOW

Saint John. R. of New Brunswick, rises on boundary between Maine, U.S.A., and Quebec, flows 400 m. to Bay of Fundy, 5-393.

Saint John Ambulance Association. Founded 1877 for education in first aid; Brigade (some 250,000 volunteers) does valuable work at crowded functions and in war-time.

St. John Lateran. Church in Rome, first built 3rd cent.; destroyed by earthquake and fire and subsequently rebuilt 4 times, the last time in 11th cent.; modernised since.

St. John's, Newfoundland. Prov. cap. and shipping point on E. coast; nearest point in Amer. to Europe; pop. 52,873; export and import trade and various mfrs.; harbour, 5-393 illus., radio station, 5-122 illus.

St. John's College, Cambridge Univ., 2-182.

St. John's College, Oxford Univ., 6 18.

Saint-Just (*sanzhüst*). Antoine de (1767-91). Fr. revolutionary, organizer of the Reign of Terror; and Danton, 3-17.

St. Kilda, Scot. Isl. of Outer Hebrides, numerous sea-fowl; vacated by its inhabitants in 1930.

St. Kitts (West Indies). See *St. Christopher*.

St. Laurent, Louis S. (b. 1882). Can. statesman; Fr.-Can. by birth; min. of external affairs 1916-18; premier from 1918.

St. Lawrence, Gulf of. Inlet of St. Atlantic at mouth of St. Lawrence r.

St. Lawrence Island. An Alaskan isl. in Bering Sea, inhabited by Eskimos, 100 m. long; and Asian land-bridge theory, 1-90.

St. Lawrence Plain. Flat, fertile region of Canada, 2 195.

St. Lawrence River. Canada, 1,170 m. long, 6 486, 2-196; water power 6 321; Quebec and sea trade, 6 322.

St. Lawrence seaway chems 2 202, 4-69 6-10, 6-487.

St. Leger, The. Horse race run at Doncaster in September, one of the five Brit. classic races; inaugurated 1776 by Col. St. Leger, 4 198.

St. Leonards. Holiday resort in Sussex, Eng.; part of Hastings (*q.v.*).

St. Louis, Missouri, U.S.A. Largest city of state and chief market for Mississippi valley; pop. 852,623; 5 227.

St. Louis. Chief tn. of Senegal, Fr. W. Africa; pop. 63,000; 7 440.

St. Lucia. Largest of the Windward Isls., area 238 sq. m.; pop. 73,470; sugar, cocoa, lime-juice, molasses.

St. Luke's Summer. In Gt. Brit., spell of the weather supposed to occur about St. Luke's Day, Oct. 18, and lasting 1-7 days.

St. Magnus. Anc. cathedral at Kirkwall in Orkney Is., Scot., 6 5.

Saint-Malo (*santalöl*). Fortified spt. and holiday resort of Fr. on Bre Channel; steamer service to Southampton; shipbuilding and other mfrs.; pop. 12,000.

St. Mark's Cathedral, Venice, 7 387; bell-tower, 1-425; Byzantine treasures, 2 149, 150; piazza, 7 367.

St. Martin. An isl. of the Lesser Antilles; the N. portion (20 sq. m.) belongs to Fr. and the S. portion (17 sq. m.) to Curaçao, Netherlands Antilles.

St. Martin, Cathedral of, Utrecht, Netherlands, 7-372 with illus.

St. Martin-in-the-Fields. Church at Trafalga Square, London; bells and services have been offered broadcast "down-and-outs" find refuge in the crypt; H. R. L. & Dick "2" Sheppard was vicar 1914-27; 5-21, 23 illus.

St. Martin's. One of the Scilly Is., 6 509.

St. Martin's Summer. In Gt. Brit. period of fine weather supposed to occur around St. Martin's Day, Nov. 11.

St. Marylebone (*ma'ribon*). Bor. n.w. London; pop. 75,761; contains Lord's cricket ground, hq. Marylebone Cricket Club (*M.C.C.*) 6-27.

St. Mary-le-Bow. Famous church, Cheapside, London, bombed during

ST. MARY REDCLIFFE

2nd World War. Its bells were famous as "Bow Bells"; Cockneys, 5-20.

St. Mary Redcliffe. Famous parish church in Bristol, Eng., 2-71; Chatterton and, 2-310.

St. Mary's. One of the Scilly Isles, 6 509.

St. Mary's Strait or River. N. Amer. channel connecting Lake Superior and Lake Huron.

St. Michael and St. George, Order of, 5-530, 4 418.

St. Michael's Island. Largest of Azores; area 300 sq. m.; pop. 126,000; chief city, Ponta Delgada, 1-330.

St. Michael's Mount, Cornwall, Eng., 2 508.

St. Moritz, Switzerland. Lottiest vil. in Upper Engadine, on Lake Moritz; winter sports; 7-211 illus., 3 311.

Saint Nazaire [sanzazair']. Fr. spt., 10 m. s.w. of Nantes, at mouth of r. Loire; shipbuilding; pop. 35,000.

St. Neots [nēts]. Tn. in Hunts, Eng.; pop. 4,697; 4-210.

Saint-Nicolas [sannēkōlah'], Belgium. Trade and mfg. centre, 12 m. s.w. of Antwerp; pop. 43,400.

St. Ninian. Brought Christianity to Scot. in 397, 7-450.

St. Omer [santōmar'], **Godfrey de.** Fr. knight, joint founder, with Hugh de Payens, of the Order of Knights Templars, 4-419.

St. Omer. Tn. in Pas-de-Calais dept., Fr. 5 m. s.e. of Calais; pop. 18,200; hq. Brit. army during early part of 1st World War; scene of Lord Roberts's death in Nov. 1914.

Saint-Ouen [santwān']. Fr. suburb S. of Paris on r. Seine; pop. 45,465; a port and mfg. centre.

St. Panoras. Bor. of S. London; pop. 138,346; contains University College and terminal rly. stations Euston, St. Panoras, and King's Cross, 5 27.

St. Patrick, Order of, 5 530, 4 418.

St. Paul, Minnesota, U.S.A., state cap., on Mississippi; pop. 309,475; important meat-packing centre; 5-222.

St. Paul or St. Paul's Rocks, tiny isl. in cent. Atlantic, N. of Equator.

St. Paul's Cathedral, London, 6-487, 5 20, 5-32 illus.; interior, 6 386 illus.; carving by Gibbons, 4-19; Great Paul bell, 1-127; first lightning conductor, 4 505; Paul's Cross, 2 36; Wren and, 7 501, 1 217.

St. Paul's School, London. Public school for boys in Hammersmith Road, to which it was transferred from St. Paul's Churchyard in 1881; it was founded by John Colet, Dean of St. Paul's, in 1509; 5 28.

St. Peter Port. Cap. of Guernsey; pop. 16,799; 2 303.

St. Peter's. Cath. in Vatican City, Rome, chief church of Roman Catholicism, where popes are crowned; world's largest Christian church. Founded 152 by Pope Nicolas V on site of medieval cath. built by Constantine; 7 382 illus., 6 128 illus.

St. Petersburg. Name of city founded by Peter the Great in 1703, now called Leningrad; history, 4 479, 6-146.

St. Peter's Hall, Oxford Univ., 6-18.

Saint-Pierre. Formerly the chief tn. of Martinique, destroyed by eruption of Mt. Pelée, 7-405 illus. f.

Saint Pierre and Miquelon. Fr. overseas territory of barren rocky isls. 10 m. off s. Newfoundland; 93 sq. m.; pop. 4,350; important cod-fishing centre.

Saint-Quentin [sankkhtān']. City of S. Fr. on r. Somme, 95 m. n.e. of Paris; battle in Franco-Prussian War (1871), 3-459; scene of several fierce battles in 1st World War; Ger. attack on Brit. 5th Army, March 21, 1918, often called battle of St. Quentin; pop. 49,000.

Saints, Battle of the. Fought on April 12, 1782. Rodney gained a notable victory over the Fr. under Comte de Grasse; the battle is named after Les Saintes isls., W. Indies.

Saint-Saëns [sansahn'], **Charles Camille** (1835-1921). Fr. musical composer

and pianist; works include the opera *Samson and Delilah*, "Dance Macabre," and "Le Carnaval des Animaux", 5-320, 5-515.

Saint-Simon [sanzsimon], **Claude Henri de Rouvroy, Comte de** (1760-1825). Founder of Fr. socialism; advocated a new organization of society on an industrial basis, ruled by industrial chiefs; popularity chiefly due to his disciples.

St. Sophia [sōfā]. Former church at Istanbul; later a mosque; since 1935 a museum; 2-119, 150, 4 304.

St. Stephen's Cathedral, Vienna, 7 398, 399 illus.

St. Stephen's Hall, Westminster, 6 88.

St. Swithin's Day, July 15, 6 488.

St. Thomas. One of Virgin Isls. (U.S.A.); 32 sq. m.; pop. 13,813. *See Virgin Islands.*

St. Thome and Principe Islands. Portuguese overseas prov. in the Gulf of Guinea; area 372 sq. m.; pop. 60,159; exports coffee, cocoa, rubber, cinchona; 6 268.

St. Tropez. Fishing port, s. France, 3-135 illus.

St. Valentine's Day. *See Valentine.*

St. Valéry-en-Caux. Coast tn. of Fr., 20 m. w. of Dieppe; fishing pt.; pop. est. 3,000; intended embarkation pt. for Brit. troops retreating from Somme, June, 1910, but s. position abandoned by Fr. and over 5,000 men of 51st Highland div. B.E.F. taken by encircling Gers. after fierce fighting; tn. liberated Sept. 1914 by 51st Highland div.

Saint Vincent, John Jervis, Earl (1735-1823). Brit. sailor, who fought with distinction off Ushant in 1778 and at Gibraltar in 1780-82, and gained a brilliant victory over the Spaniards off Cape St. Vincent in 1797; Admiral of the Fleet in 1821.

St. Vincent. Brit. isl. of Windward group, W. Indies, area 150 sq. m.; pop. 61,600; cap. Kingstown, on s.w. coast.

St. Vincent. Port. isl. of Cape Verde group, off s.w. coast of Africa; area 75 sq. m.

St. Vincent, Cape. Promontory on s.w. extremity of Portugal extending into Atlantic Ocean; Brit. fleet under Jervis and Nelson defeated Sp. fleet in 1797.

Sakais [sah'kiz]. A people of the Malay Peninsula, 6 312, 5 96 illus.

Sakalava. Native tribe in Madagascar, 5 65.

Saké [sah'kū]. National drink of Japan made from rice; highly intoxicating.

Sakhalin [sahkahlēn']. Long mountainous isl. near E. coast of Siberia; area 27,800 sq. m.; pop. 339,000; 4 part (Karafuto) area about 14,000 sq. m.; ceded to Japan 1905, restored to Russia 1945; large forests, fisheries; 4 340.

Saki. S. Amer. monkey, 5-241.

Sakkara [sakkah'ra]. Eg. vil. near Nile r., 15 m. s.w. of Cairo; noted for Step Pyramid and other tombs, 3 184, 185 illus., 6 313.

Sakyamuni. *See Buddha.*

Sala [sah'la], **George Augustus** (1828-95). Brit. journalist; friend of Dickens, to whose *Household Words* and *All the Year Round* he contributed; special war and foreign correspondent for the *Daily Telegraph*.

Saladin (1138-93). Sultan of Syria and Egypt, and leader of Mahomedans in the Third Crusade, 6 488, 3 2, 3 34; conquest of Egypt, 3 175; conquest of Jerusalem, 4-363.

Salamanca. Old Sp. city 110 m. n.w. of Madrid; pop. 91,000; anc. Salamanca, captured by Hannibal; beautiful medieval buildings; Wellington defeated Fr. in Peninsular War; 6-117, 7-103.

Salamander. An amphibian, related to the newts, 6-488; eggs, 3 172.

Salamis [salamis]. Greece. Barren mountainous isl. in Gulf of Aegina; 36 sq. m.; famous for defeat of Persian fleet by Greeks in strait between isl. and Attic coast (480 B.C.); 6-160, 1-227.

Salayer [sahlier] or **Saleyev Islands.**

SALSIFY

A fertile group in Indonesia s. of Celebes; area 270 sq. m., of which 250 sq. m. are occupied by Salayer Isl.; pop. of group 63,000; timber, tobacco, potatoes, indigo, cotton.

Salazar, Antonio de Oliveira (b. 1889). Portuguese statesman, prime minister of Portugal from 1932; 6 269.

Salem. Tn. in Madras state, India; pop. 129,702; 5 70.

Salem, Mass., U.S.A. City 13 m. n.e. of Boston on Atlantic; pop. 41,880; in 1692 many tried for witchcraft and 20 put to death; "House of the Seven Gables," 5-145 illus.

Salem. Cap. of Oregon, U.S.A.; pop. 43,064; 5 532.

Salerno [saler'nō]. It. port on Gulf of Salerno; pop. 67,000; textiles; medical univ.; Site of Allied invasion, Sept. 1943, 7 491.

Sales. In commerce; advertising and costs, 1 22.

Sales Management, careers in, 2 240, 234.

Salford. Tn. of s.e. Lancs, adjoining Manchester; pop. 178,036; cotton, iron, and chemical indus., 5 114, 4 144.

Salford Priors. Village in Warwickshire, Eng., 3 251 illus.

Salicin [sal'isin]. Substance obtained from willow, used for the relief of influenza and rheumatism.

Salic Law. In popular usage, a code debarring succession to females and to those tracing descent from a woman; instigated by Salic or Sallian Franks of the 5th cent. A.D.

Salina Cruz. Spt. on w. coast of Mexico on Gulf of Tehuantepec; pop. 6,000; 5 186.

Salisbury [sawlz'beri], **Frank O.** (b. 1871). Brit. portrait painter; first exhibited at Royal Academy in 1899; portraits of King George V and Queen Mary, George VI's Coronation, and other state pictures.

Salisbury, James Hubert Gascoigne Cecil, 4th Marquess of (1861-1917). Brit. politician; lord privy seal (1903-05); pres. of board of trade (1905); lord pres. of the council (1922-21); lord privy seal (1921-29).

Salisbury, Robert Arthur Talbot Gascoigne Cecil, 3rd Marquess of (1840-1903). Brit. Cons. statesman; sec. of state for India, as Lord Robert Cecil, 1866; for, sec. 1878; premier 1885, 1886, and 1895-1902; cautious, but forceful when necessary, he was the greatest diplomatist of his generation; 2 285.

Salisbury, Robert Cecil, Earl of (c. 1565-1612). Eng. statesman; younger son of Lord Burghley, 2 285.

Salisbury. Co. tn. of Wilt., Eng.; pop. 32,910; famous for beautiful cathedral, 6 489; cathedral, 2 265 illus.

Salisbury. Cap. of S. Rhodesia; pop. 126,000; 6 489, 6 395.

Salisbury Plain. High, rolling plain in Wiltshire, s. of Salisbury, 6 489; Stonehenge, 7 163; as army training-ground, 7 457.

Saliva. Natural fluid which keeps the mouth moist, secreted by glands of tongue and mouth, 4 27; salivary glands, 1 141.

Sallow. A species of willow, 7-154.

Salust [salus Sallustius Crispus] (86-34 B.C.). First Roman historian as distinguished from annalists, 4 150.

Salmon. A food fish, 6 489; eggs, 3 171 diag.; for canning, 2 199 illus.; fishing, 3-379 illus., 3 382, 384, 7-17; fishing nets and traps, 3 380, 376 illus.; migration, 5-202.

Salome [salō'mē]. Daughter of Herodias, who bade her ask of Herod the head of John the Baptist, 4-170.

Salonika. City and port of Greece at head of Gulf of Salonika; pop. 217,000; 4-79; in 1st World War, 7-483.

Salop. Alternative name for Eng. co. of Shropshire. It is not an abbreviation.

Salpinx. Anc. Gk. musical instrument, 5-302.

Sal'sify or Oyster Plant. Purple-flowered composite plant similar to goats-beard.

SALT

Salt, Sir Titus (1803-76). Brit. mfr.; founded woollen business in Bradford, Yorks, that grew to such an extent that tn. of Saltaire was erected for it in 1853.

Salt or Sodium chloride, 6-490, 7-82; in curing bacon and ham, 1-312; and Bedouin custom, 1-192; crystals, 3-4, 5-213 illus.; lowers freezing point of water, 3-466; industrial uses, 6-492; salt pans in Pakistan, 6-40 illus.; in sea-water, 6-496.

Salt, in chemistry. A compound formed from an acid by replacement of part or all of its hydrogen by a metal or basic radicle, 1-11.

Saltash, Tn., in Cornwall, England; pop. 7,900; bridge, 2-64, 2-99.

Saltcoats, Scot. Spt. and holiday resort in Ayrshire, 30 m. s.w. of Glasgow; coalmining; pop. 12,000.

Salters' Company, 4-826.

Salt Glaze, for stoneware pottery, 6-276.

Saltito [salté'yo]. Trade centre in N.W. Mexico, cap. of Coahuila state; pop. 75,721; textile mfrs., flour; alt. 5,200 ft.

Salt Lake City, Utah, U.S.A. State cap. and leading commercial city; pop. 182,120; founded by and h.q. of Mormons; state univ.; distributing centre for minerals and agric. produce of surrounding region; 7-371; Mormon temple, 5-264 illus.

Salto, Uruguay. City on Uruguay r., 250 m. N.W. of Montevideo; pop. 30,000; shipping point for stock-raising dist.

Saltpeatre, 6-492; as fertiliser, 5-444; in fireworks, 3-361.

Salvador, El. Republic in Central America; area 13,173 sq. m.; pop. 1,858,656; cap. San Salvador; 6-492, 2-292; earthquake, 3-153.

Salvage, lifeboatmen's claim to, 4-195. "Salvaseen" drug, discovery of, 3-127.

Salvation Army, 6-493; founding, 2-13.

Salt volatile. Solution of ammonium carbonate and ammonium hydroxide; stimulating agent in smelling salts.

Salween or Salwin. R. of S. Asia; rises in N.E. Tibet and flows 1,750 m. E. principally through Burma to Gulf of Martaban.

Salzburg [zaltsh'borg]. Austrian city beautifully situated in Salzbuur Alps, near Bavarian border; pop. 106,900; cap. of prov. of Salzburg; cath. and many other fine buildings; home of Mozart and scene of annual Mozart music festival; 1-323 illus.

Samaria [samar'ia]. Anc. city of Palestine, 35 m. N. of Jerusalem; became cap. of Israel 9th cent. B.C.; captured by Assyrians (721 B.C.). 6-374. Name also applied to surrounding region.

Samaritans. The descendants of marriages between Israelites and Assyrians, 4-371.

Samarium (Sm). Chem. element; atomic no. 62; atomic weight 150.13; 3-221; weak radio-activity, 6-352.

Samarikand [samar'ikand']. U.S.S.R. Important trading city of Uzbekistan, republic of Soviet Central Asia; pop. 154,000; anc. Mavennat; f-266, 271 illus.

Samarra. Ruined city in Mesopotamia, 5-176 illus.

Sambre [sahn'br]. R. in N.E. Fr. and Belgium; rises 120 m. N.E. of Paris and flows 100 m. N.E. to Meuse at Namur, 5-183.

Sam Browne. Uniform belt worn by officers in Brit. army. Designed by Gen. Sir Samuel Browne (1824-1901). Originally consisted of a belt and two straps passing over the shoulders and crossing at the back; now usually one strap, over right shoulder.

Sannites. Anc. people of cent. Italy; wars with Rome, 6-130.

Samoa. A chain of nine isls. and five lalets in the S. Pacific; 6-494; stamp, 6-30 illus.

Samos [sá'mos]. Small Greek is. in Aegean near coast of Asia Minor; pop. 77,800; flourished 6th cent. B.C.; famous temple of Hera; exports wines, raisins; colonised by Greeks.

Samothrace. Small mountainous Gk. is. in N. Aegean; "Winged Victory" found here 1863, now in Louvre, 4-90, 5-47 illus.

Samoyed. People of Russian Arctic, numbering some 27,000; 1-221.

Samoyed dog. A domestic breed used by the Samoyed people for hunting and herding and as a draught animal. Introduced in Gt. Brit. in 1889 as pet dog.

Sampan. Light boat used in Eastern inland and coastal waters, 1-268, 1-302, 1-449 illus.

Sampler. Small embroidered panel, often showing text or motto, 3-238.

Samson. Jewish strong man, whose feats are recorded in the Old Testament, 6-495, 4-374.

Samson Agonistes. Tragedy by Milton, 6-495, 5-211.

Samson and Delilah. Opera by Saint-Saëns, 5-520, 6-495.

Sam'uel. Last of Hebrew judges; anointed Saul and David (1 Samuel); gave name to 9th and 10th books of Old Testament, which contain the history of Israel from the birth of Samuel to the death of David.

Samuel, Herbert Louis Samuel, 1st Viscount (b. 1870). Brit. Liberal politician and philosopher; home-sec. 1916 and 1931-32, high commissioner for Palestine 1930-32; Lib. leader in House of Lords, 1941-55.

Samurai. Knights in Jap. feudal system, 4-314.

San Antonio, largest city of Texas, U.S.A.; pop. 401,142, 7-260.

Sanchez, Florencio (1875-1910). Argentine dramatist, 7-101.

Sancti. Vil. in Bhupal, Rep. of India; temple gateway, 4-245 illus.

San Cristobal Island. See Chatham Island.

Sancti Spiritus, Cuba. City 20 m. from S. coast; pop. 92,300; founded in 1515.

Sand, George. Pen name of Amandine Lucile Auroré Dupin, Baroness Dudevant (1804-76). Fr. novelist and feminist.

Sand, 6-495; desert sands, 3-78; quartz in, 6-320; in Sahara, 6-485; Libyan desert, 3-182 illus.

Sandalwood. Tree of E. Indies, fragrant heartwood, used for making boxes; yields essential oil for perfume, 5-506.

Sandarac [san'darak]. Resin, obtained from sandarac tree which grows in N. Africa; used in varnish making.

Sand-box tree. See Monkey's Dinner Bell.

Sandby, Paul (1725-80). Brit. water-colour painter, 3-261.

Sanderling. A wading bird (*Calidris arenaria*) about 8 in. long, distinguished by having only 3 toes; winter visitor to Britain; plumage white underneath, bluish grey above in winter and chestnut in summer.

Sand-fly. Insect, carrier of disease, 3-402.

Sand-glasses. Hour-glasses to mark the passing of time; in churches, 2-412, 7-277 illus.

Sandhurst. Royal Military Academy, Berks, Eng.; cadets, 2-158.

San Diego [sande'gō]. California, U.S.A. Spt. and Pacific naval base; 126 m. S.S.P. of Los Angeles; splendid harbour; also a notable holiday resort; mfrs. fly. rolling stock and aircraft; pop. 334,387; 2-177.

Sanding Gear, in locomotives, 5-4.

Sand Lizard, 4-530 illus.

Sand Martin. Bird, 7-198; migration, 5-201 illus. f.

Sandow, Eugen (1867-1925). Physical culturist, b. at Königsberg, Ger.; famous as a wrestler; in 1897 was awarded world's championship belt for weight-lifting; wrote *Strength and How to Obtain It*.

Sandpiper. Wading bird, native to N. temperate regions, 7-408; fledgling, 1-170 illus.

Sandringham House, Sandringham, Norfolk; country residence of Royal family. Built in 1870 for Edward VII. then Prince of Wales; considerably damaged by fire in 1891.

SAN SEBASTIAN

Sandstone. Sand cemented into rock; types of, 6-320, 6-496.

Sand wasp. A British wasp, 7-424.

Sandwich, John Montagu, 4th Earl of (1718-92). Brit. politician, notorious for his personal and political vices; first lord of the Admiralty (1771-82); invented sandwich, 3-282.

Sandwich. Small spt. in Kent, on r. Stour; one of Cinque Ports; important in Middle Ages; pop. 4,142. famous golf course; 2-402.

Sandwich Islands. See Hawaiian Islands.

Sandwich Tern. Bird; migration 5-204 illus. f.

Sandy Hook. Narrow sandy peninsula in U.S.A., on New Jersey coast extending 6 m. N. and partly enclosing New York Bay.

Sandy soil, 7-83.

San Francisco, California, U.S.A. pop. 760,753; 6-496; earthquake (1906), 3-153; Golden Gate bridge, 2-67, 66 illus.

San Francisco, Treaty of (1951). Signed between Japan and U.S. states with whom she had been at war, 4-350.

Sanger, "Lord" George (1827-1911). Brit. showman; inaugurated the travelling circus; see Astley's circus, 2-301.

Sangster, Charles (1823-93). Canadian poet, 2-203.

Sanhedrin. The supreme judicial council of the anc. Jews.

Saniele. Plant of the family Umbelliferae; leaves, 4-371 illus.

San Joaquin [wahkén'] River, California, U.S.A., rises in Sierra Nevada near Yosemite National Park, flows W. and N. to meet Sacramento near its mouth; 350 m. long.

San José. Cap. and largest city of Costa Rica; pop. 86,718; centre of agric. region; coffee trade; 2-51.

San Juan. Cap. and largest city of Puerto Rico; pop. 221,203; 6-301.

San Juan. R. of Colombia, S. America, about 150 m. long, 2-457.

Sankey, Ira David (1810-1908). Amer. singer, popular hymn-writer, and evangelist, long associated with D. L. Moody (q.v.).

Sankey, John Sankey, 1st Viscount (1866-1948). Brit. lawyer; judge of high court (1911); presided over Sankey commission (1919), on labour conditions in coal mines; lord chancellor 1929-35.

San Luis Potosi, Mexico. State in centre; area 21,000 sq. m.; pop. 678,780; cap. San Luis Potosi.

San Luis Potosi. Commercial and mining centre in Mexico, 225 m. N.W. of Mexico City; pop. 156,321; mining region; immense silver-lead reduction works; 5-186.

San Marino. Small republic in N. Italy, nr. Adriatic coast; area 38 sq. m.; pop. 12,100; cap. San Marino; 6-497, 498.

San Martin [mahitén'], José de (1778-1850). S. Amer. patriot, general and statesman; led famous expedition across Andes (1817); drove Spaniards from Chile; captured Lima, Peru, and proclaimed Peruvian independence (1821), 1-225.

San Remo. Winter resort on Italian Riviera, 4-310 illus.

San Salvador. Cap. of El Salvador, Cent. Amer.; pop. 160,380; industrial and trade centre; 6-493.

San Salvador. Volcano overlooking San Salvador, cap. of El Salvador, 6-493.

San Salvador (Bahamas). See Watlin Island.

Sansculotte [sahnkultót']. Name given to the revolutionaries of 1790 by the Fr. aristocrats and afterwards adopted by them as a title of honour; term means "without breeches" and was applied to the revolutionaries because they forsook knee breeches for trousers.

San Sebastian. Spt. mfg. city, and fashionable resort on Bay of Biscaya, 12 m. from hr.; suffered major sieges, notably in 1719, 1808, 1811, 1836, and 1936; pop. 113,776.

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Sanskrit. Anc. language of the Hindus. 1-262, 6-158 : epics and dramas in. 4-250.

Sans Souci [sahn soosé']. Palace and royal park in Potsdam, near Berlin, built by Frederick the Great.

San Stefano [stáfah'nó]. European Turkey, port on Sea of Marmara; treaty ending Russo-Turkish War (1878). 7-335.

Santa Ana. 2nd largest city of Salvador, Cent. Amer., 40 m. N.W. of San Salvador; pop. 51,676; 6-493.

Santa Clara. City in cent. Cuba; cap. of Las Villas prov.; pop. 122,240; exports asphalt, graphite, tobacco.

Santa Claus. Identified with Father Christmas; origin of legend, 2-382.

Santa Cruz [santá kروز]. Andres (1794-1865). Bolivian patriot, general in war of independence, pres. 1829-39; failed in attempt to federate Peru and Bolivia.

Santa Cruz or Ste. Croix. Caribbean Isl. of the Virgin group, belonging to U.S.A.; area 82 sq. m.; pop. 16,200; (Christianized is the cap., pop. 4,500. Chief crop is sugar.

Santa Cruz or Queen Charlotte Islands. Isl. group in Pacific Ocean, Incl. in Brit. Solomon Is. group; area about 360 sq. m.; discovered in 1595; 6-26.

Santa Cruz de la Sierra. Bolivia. Tn. on E. slope of Andes; pop. 42,746; rubber centre.

Santa Cruz de Tenerife [Anfó'rfa]. (Cap. and port of Canary Isls. on Isl. of Tenerife; pop. 108,657; Nelson lost arm during British bombardment, 1797; 2-208.

Santa Fé [fá]. Argentina. City on arm of Paraná r., 95 m. N. of Rosario; pop. 168,011; trade in hides, timber, shipbuilding; univ.

Santa Fé. Cap. of New Mexico (U.S.A.); pop. 27,547; 5-400.

Santa Fé de Guanaquato. See Guanaquato.

Santa Isabel. Cap. of Spanish Guinea, on the Isl. of Fernando Po; pop. of district 15,000.

Santal. Primitive tribe of N. India, a remnant of the pre-Aryan pop., retaining many early customs.

Santa Margherita. Holiday resort in Italy, 3-311 illus.

Santa Maria. Mt. in Guatemala, (cent. Amer. (12,300 ft.), 4-101.

Santa Maria del Fiore. Cath. at Florence; dome, 2-392 with illus.

Santander. Sp. Important spt. on Bay of Biscay; pop. 102,462; fisheries, shipyards; fine harbour; exports iron ore, paper, wine.

Sant' Angelo. Castle of. Fortress at approaches to Vatican hill, Rome. Formerly massive tomb to emp. Hadrian.

Santayana, George (1863-1952). Amer. philosopher and author (*The Sense of Beauty; The Life of Reason*).

Santiago. Cap. of Chile and largest S. Amer. city W. of Andes; pop. 1,121,751; 6-498.

Santiago Bay. Excellent landlocked harbour on S.E. coast of Cuba; Sp. fleet destroyed in Sp.-Amer. War.

Santiago de Compostela. City of Spain; pop. 55,553; cathedral contains shrine of Santiago (St. James); pilgrimage centre, 6-202; cathedral, 7-106 illus.

Santiago de Cuba. Port on S.E. coast of Cuba; pop. 120,577; mining dist.; extensive export trade; founded by Sp. (1514), early cap. of Cuba; badly damaged by earthquake (1932); 8-7.

Santo Domingo. Isl. of W. Indies, divided politically into Dominican Republic and Haiti (q.v.); Columbus's colony, 2-467.

Santo Domingo (town). See Ciudad Trujillo.

Santorin [santórin'] (corruption of St. Irene). Volcanic Isl. in Aegean Sea southernmost of Cyclades; area 87 q. m.; important remains of prehistoric Aegean civilization; anc. Thera, powerful commercial state.

Santos, Brazil. Port 200 m. S.W. of Rio Janeiro; pop. 206,900; good

harbour; port for São Paulo; greatest coffee-shipping port in world, 7-96, 2-48.

Santos-Dumont, Alberto (1873-1932). Aeronaut, b. Brazil; built first airship propelled by internal-combustion engine; made first aeroplane flight in Europe with Wright machine, 1-39; airship, 1-83.

San Vicente [vesén'tá]. City of republic of El Salvador, 30 m. E. of San Salvador, on Acahuapa r.; pop. 10,945; commercial and manufacturing centre.

São Francisco River. Chief r. in S. Brazil; rises N.W. of Rio de Janeiro, flows 1,800 m. N. and E. to Atlantic, 2-49.

São Luiz. Tn. of Brazil, cap. of state of Maranhão; pop. 70,000.

Saône [són] River. In E. Fr., rises just W. of Vosges Mts., flows 300 m. S. to Rhône; connected with Loire and Seine by canals, 6-396.

São Paulo [sow pow'lo]. Seaboard state of S. Brazil; area 91,000 sq. m.; est. pop. 7,230,100; cap. São Paulo.

São Paulo. 2nd city in Brazil, 210 m. S.W. of Rio de Janeiro and 25 m. from coast; pop. 2,228,000; industrial and trade centre; greatest coffee market, 2-48.

São Salvador (Tn. Brazil). See Bahia.

Sap. Plant juice; in trees, 7-313.

Sapelli Mahogany. Timber resembling mahogany, grown in W. Africa, 5-87.

Saponification. The hydrolysis (q.v.) of esters (q.v.) into acids and alcohols by the action of alkalis or acids, or by boiling with water, or by the action of superheated steam.

"Sapper" (Lt.-Col. Cyril McNelle) (1888-1937). Brit. author; creator of "Bull-Dog Drummond," who appeared in a series of thrillers.

Sapper. Name given to a private in the Royal Engineers; origin of name, 5-218, 1-250.

Sappers. The Royal Engineers, 5-218.

Sapphire [saf'ir]. A precious stone, 7-164, 165.

Sappho [saf's] (7th-6th cent. B.C.). Gk. poetess, b. Isl. of Lesbos; called "Flower of the Graces"; known to-day by few exquisite fragments of verse; legend says she hung herself from Leucadian rock for unrequited love; 4-83.

Saprophytes. Organisms living on dead vegetable and animal matter, 6-284, 3-489.

Saps. Name given to sunken passages in military works, 5-218.

Sapwood. of trees, 7-313.

Saraband. A slow and stately Spanish dance with music in triple time; probably originated among Saracens.

Saracens. Name given to followers of Islam in Middle Ages, 5-89. See also Arabs; Mahomet; Moors.

Saragossa (Sp. Zaragoza). Sp. rly. and commercial centre on Ebro, 175 m. N.E. of Madrid; pop. 204,256; taken by Fr. after heroic resistance by British in Peninsular War (1808-09); former capital of Aragon, 7-103; bridge, 7-107 illus.

Sarah or Sarai. Wife of Abraham, 1-6.

Sarajevo or Serajevo. Tn. of Yugoslavia, cap. of Bosnia; pop. 118,000; Francis Ferdinand assassinated here, 2-20, 1-326, 7-478, 7-518.

Sarasate [sarashé'tá] Pablo de (1844-1908). Sp. violinist and composer; noted for lively dance music.

Saratoga, Battles of (Sept. 19 and Oct. 7, 1777), fought at Stillwater, 12 m. S.E. of Saratoga Springs, N.Y., U.S.A.; Burgoyne surrenders (Oct. 17), 1-139.

Saratov, U.S.S.R. Important city on Volga, 450 m. S.E. of Moscow; pop. 376,000; rly. workshops, mfrs.; exports grain; extensive river trade.

Sarawak. Brit. crown colony in N.W. Borneo; area 50,000 sq. m.; pop. 568,585; cap. Kuching; 6-498, 2-19; in 2nd World War, 7-491.

Sarcophagus [sahrk'of'agus]. A stone coffin; sculpture of Alexander on, 1-99 illus.

Sardanapalus. See Assurbanipal.

Sardines or Pilchards. Small food fish which belong to the herring family,

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so called because they were once caught chiefly off coast of Sardinia, 4-172.

Sardinia. It. Isl. in Mediterranean W. of It., area 9,302 sq. m.; pop. 1,273,714; cap. Cagliari; 6-499, 4-304; map, 4-305.

Sardinia. Former Is. kingdom, whose ruler became King of It. in 1861; 4-316, 3-314. See also Savoy.

Sardia or Sardes. (Cap. of anc. Lydia, Asia Minor; flourished under Croesus; destroyed by Timur (A.D. 1402).

Sardonix [sahr'doniks]. A variety of quartz, 6-320.

Sardou [sahr'dó'], Victorien (1831-1908). Fr. dramatist, dextrous and prolific; chief works, *Fédora, Madame Sans-Gêne, La Tosca*.

Sargasso Sea. Vast mass of floating seaweed in N. Atlantic Ocean, 6-528 4-105; and Atlantis, 1-295 diag.

Sargent, Sir (Harold) Malcolm Watts (b. 1895). Musician and orchestral conductor. Became conductor of B.B.C. Symphony Orch. in 1950.

Sargent, John Singer (1856-1925). Anglo-Amer. painter; gained reputation for brilliant portraiture. Among his works are portraits of Ellen Terry, Lord Londonderry, and Henry James; 2-264; Frieze of the Prophets, 6-295.

Sargon I (c. 3000 B.C.). Semitic chieftain, King of Akkad, N. Babylonia; conquest of plain of Shinar, 1-336; conquest of the Sumerians, 5-176.

Sargon II (reigned 722-705 B.C.), king of Assyria; conquest of Isr. c. 1-338.

Sark. One of the Channel Islands; area about 2 sq. m.; pop. 563 (with Brechou), 2-302.

Sarong. Garment worn by Malayan women, 5-93.

Saronic Gulf. Arm of Aegean Sea, separating Peloponnesus from N.E. Greece.

Saroyan, William (b. 1908). U.S. novelist, short-story writer and playwright, 7-366.

Sarpsborg. Tn. in Norway; pop. 13,234; 5-464.

Sarsaparilla. A cooling drink made from the dried roots of smilax and woody vines; red in colour prepared by boiling the roots in water.

Sarsens. Name given to blocks of hard sandstone, used in building Stonehenge, 7-163.

Sarto, Andrea del (1487-1531), Florentine artist, great draughtsman and colourist, 6-386; self-portrait, 4-320.

Sartor Resartus (1833-34). Humorous and satirical work on the philosophy of clothes by Thos. Carlyle, 2-24.

Sartorius. Leg muscle, 6-298 illus.

Sartre, Jean Paul (b. 1905). Fr. novelist and dramatist; plays *Huis-Clos, Les Mouches*; novel *Les Chemins de la Liberté*; 3-456.

Sash. See Architectural Terms.

Saskatchewan. Prov. of cent. Canada and largest wheat-growing region; area 251,700 sq. m.; pop. 831,728; cap. Regina, 6-499.

Saskatchewan River, Canada. A river formed by union of W. and S. Saskatchewan branches near Prince Albert, Saskatchewan; flows 240 m. E. to Lake Winnipeg, 6-499.

Saskatoon. Tn. in Saskatchewan prov., Canada; pop. 53,268; univ.; 6-500.

Saskia van Vlyenborch. See Vlyenborch.

Sassafras. A tree, native of N.E. Amer.; is used in medicine; makes fine yellow dye; also sassafras tea; belongs to laurel family.

Sas'sand Dynasty. Last native dynasty of anc. Persia (226-637).

Sassoon, Siegfried Lorraine (b. 1886). Brit. poet and author (*Memoirs of a Fox-hunting Man; Memoirs of an Infantry Officer; Collected War Poems; Sherston's Progress*). Created O.B.E. in 1951.

Satan, the Devil; in Milton's *Paradise Lost*, 5-211.

Satany. See Money (list).

Satellites. of planets, 6-213.

Satin. Silk or rayon material, with an even, smooth glossy surface.

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Satire [sə'tɪrɪ]. A type of literary composition in which vice and folly are ridiculed.

Satie. See **Satie**.

Satrap. Title given to a Persian governor of a province. 6-129.

Satsuma ware. A kind of earthenware made in Japan; named from the prov. of Satsuma in s.w. of Kyushu. 4-351 with illus.

Saturday. 7th day of week. origin of name. 3-55.

Saturn. In Rom. myth., god of agriculture. 6-500; Saturday named after. 3-55.

Saturn. one of the planets. 6-500. 6-213; atmosphere of. 1 82; distance from sun. 1 282; phases of the rings. 6 500 illus. f.; in solar system. 1-278 diag.

Saturnalia. Rom. festival, in honour of the god Saturn, held in the middle of December each year; the festival was marked by a general holiday: 6-500; holly custom. 4 187.

Saturnian verse, early Latin verse form. 4-119.

Satyrs. In Gk. myth., goat-like beings, attendants of Bacchus or Dionysus. 3-91. 6-52; dance of. 3-116 illus.

Saichie Burn. Battle of 1488 in which James III of Scot. was defeated by rebels. 1-385.

Saudi Arabia. Kingdom formed in 1932 by the union of Ilclaz and Nejd, with an area of some 800,000 sq. miles and a pop. of about 1,500,000: 1-190; flag. 3-385 illus. f.

Saudi Guinea. See **Money** (hist).

Sauerkraut [sour'kraut]. A good popular in Ger.; it consists of shredded cabbages which have been salted and allowed to ferment.

Saul (d. c. 1010 B.C.). First King of Israel. 4-374; and David. 3 54.

Sault of Taurus. See **Paul**. St.

Sault Sainte Marie [sə'sən mar'v]. The rapids of St. Mary's River or Strait, between Lakes Superior and Huron. N. Amer.

Sault Sainte Marie. Tn. in Michigan. U.S.A.; pop. 17,912; 5-192.

Sault Sainte Marie Canals. Two ship canals, connecting Lakes Superior and Huron. U.S. waterway (Mich.) opened 1855, length 1.6m., 4 68; Canadian canal (Ont.) built 1888-95, length 1.3 m., 5-513.

Sadrashtra. State of Rep. of India; area 21,062 sq. m.; pop. 4,136,005; cap Rajkot. 4-241.

Sauterne. Fr. white wine made from grapes grown in Sauterne dist., s. of Bordeaux. Chateau d'Yquem is considered the finest.

Savage, Richard (1696-1743). Eng. poet and playwright, friend of Dr. Johnson; works include a comedy *Love in a Cell*; a tragedy, *Sir Thomas Overbury*; and his masterpiece, *The Wanderer*, a poem. Died in a debtor's prison at Bristol.

Savaii. Isl. of the Brit. Western Shamoan group; area 703 sq. m.; mountainous, rising to 6,094 ft. Contains towns of Matautu and Amoa; 6-494.

Savannah, Georgia, U.S.A. Important Atlantic p.t. and 2nd largest city of state, on Savannah r.; mfrs. machinery, cotton goods, and fertilizers; pop. 119,638; 3-524.

Savannah, r. of U.S.A.; rises in Blue Ridge Mts., flows s.e. 150 m. to Atlantic Ocean.

Savannah. Early trans-Atlantic steamship. 7-29.

Savannas, type of plain. 6-187.

Save [sə'v]. One of chief tributaries of the Danube; rises in Carpathia and flows 500 m. across Yugoslavia.

Saverlake Forest, Wiltshire, 2 m. from Marlborough; about 16 m. in circumference, famous for avenues of beeches and fine deer park. 3-111.

Savery, Thomas (1650-1715). Eng. inventor; steam 'pumping engine. 7-152.

Savings accounts, in banks. 1-365.

Savona [sav'ona]. City on Italian Riviera, 25 m. s.w. of Genoa; pop. 64,000; good harbour; important iron industries; potteries.

Savonarola, Girolamo (1452-98). Florentine priest and reformer. 6-500, 3-393.

Savory. Labiate plant grown as a potherb; chief characteristics, narrow leaves and purple flowers; native to s. Europe.

Savoy. Dist. of London between the Strand and the Thames; includes a chapel royal, hotel, and theatre of that name, which commemorates a palace built here in 1245 by Peter, Earl of Savoy and Richmond.

Savoy, House of. Ancient royal family of Europe, a branch of which reigned over Italy until 1918; founded by Humbert the White-handed in first half of 11th cent. and ruled over Savoy and Piedmont for 9 centuries.

Savoy and Piedmont. Former duchy lying between It. and Fr. in w. Alps; chequered history under House of Savoy after 11th cent., 3 311, 4-316; became part of kingdom of Sardinia in 1720; and Geneva. 3 512.

Savoy cabbage. A wrinkled-leaf variety, widely cultivated in Eng., 2-151 with illus.

Savoy operas. See **Gilbert and Sullivan**.

Sawel Mt. Highest point in Londonderry, N. Ireland. 2,240 ft., 5 33.

Sawfish. Shark-like fish. 6 501; compared with swordfish. 5-128.

Sawflies. 6 501.

Sawmill, in lumbering. 5-50.

Saws, used in quarrying. 6 320.

Sawyer beetle. One of the longhorn beetles living in rotten or decaying wood; jaws. 4-266 illus.

Sax, Antoine Joseph (known as Adolphe) (1815-94). Belgian maker of musical instruments, and inventor of saxophone and saxhorn. 5-308 illus.

Saxe, Maurice (1696-1750). Illegitimate son of Augustus the Strong of Saxony and Poland; marshal of Fr., one of the greatest generals of his age; victor of battle of Fontenoy (1745) in War of Austrian Succession.

Saxe-Coburg-Gotha. Former Ger. duchy; Prince Albert, consort of Queen Victoria, was the younger son of the 1st duke; Coburg added (1919) to Bavaria, but remainder of duchy is part of Thuringia; 7-396. Brit. sovereigns Edward VII and George V were of this House (renamed Windsor 1917).

Saxe-Weimar, Karl August, Duke of (1758-1828). Ger. nobleman, patron of art and letters; friendship with Goethe. 4-38; patron of Schiller. 6 502.

Saxifrage. A garden plant. 6-501 with illus. f.

Saxo Grammaticus (12th cent.). Dan. historian, wrote *Historia Danica*; source of Hamlet story. 4-122.

Saxons. A Germanic people of N. Ger. appearing in history in 2nd cent., 6-502; invasions of Britain. 5-199, 3-276. 2-75.

Saxony. A former kingdom of Germany. 6-502.

Saxony. Land in Russ.-occupied E. Germany; cap. Dresden. 6-502.

Saxony-Anhalt. Land of E. Germany. 6-502.

Saxophone. Musical instrument. 5-307, 308 illus.

Sayanak Mts. Extension of Altai Mts., central Asia, on borders of Mongolia and Siberia. Average height 6,000 ft.; 6-472.

Saye and Sele, Lord (d. 1450). Lord chamberlain and lord treasurer to Henry VI of Eng.; was beheaded by rebels under Jack Cade.

Sayers, Tom (1826-85). Brit. prizefighter; fight with Heenan. 2-30.

Scabious. Name of several plants of family *Dipsacaceae*, common on dry hills and heaths in Eng. Field scabious (*Scabiosa arvensis*) is a tall plant with the pale blue-lilac flower-heads, each head consisting of a large number of small, irregular flowers; other species are devil's-bit (*S. succisa*) so-called because of its

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truncated roofstock, said to have been bitten off by the devil (bluish flowers, very common on dry pastures), and small scabious (*S. columbaria*), with smaller flowers, found in heathy wastes and dry pastures; the stem leaves of the small scabious are pinnate, those of devil's-bit entire. All these plants flower in late summer and autumn.

Scaveola [sə'vɔlə]. **Gaius Mucius**. Legendary Rom. hero; captured by enemy and threatened with death by torture unless he would betray comrades, thrust right hand into fire and held it there until consumed.

Seafell. Mt. in Lake Dist., Eng. 3,162 ft., 4-438.

Seafell Pike. Mt. of Cumberland, Eng. highest mt. in Eng., 3,210 ft. 3 10, 4-438, 439 illus.; composition of rocks. 2 88.

Scale (music). See **Musical Terms** (hist).

Scale insects. Family of insects including Cottony Cushion scale, San José scale, Mussel scale, etc. Length up to 1 in., brown or black. Injurious to citrus fruits and apples. Many have hard, scaly coverings; others have waxy, powdery excretion.

Scallops [skal'op]. Bivalve molluscs. 6 502, 7 24 illus. f.

Scalp, in Man, no. of hairs on. 4 117.

Scanderbeg (George Kastrioti) (1403-67). Albanian leader and national hero, called Iskander Bey by the Turks. 1-92, 7-334.

Scandinavia. European peninsula divided between Norway and Sweden. Term often extended to include Denmark. Derived from Scandia, anc. name for s. Sweden. 3 310. Vikings. 7-100.

Scandium (Sc). Rare metallic element of the aluminum group; atomic no. 21; atomic weight 45.10; 3 224 discovery. 3 225.

Scanning. The traversing of a scene or picture by a beam or spot of light for the purpose of television or of picture transmission by radio. 7 251.

Scanlon, in poetry. 6-233.

Scapa Flow. Naval anchorage in Orkney Isls., famous in both world wars. 6 4.

Scapula. See **Shoulder blade**.

Scarab beetles, habits. 1-411, 413 illus.

Scarborough. Popular seaside resort in Yorkshire; pop. 43,983; ancient castle; spa; 24 beautiful bays, fisheries; bombarded by German war-ships in 1914.

Scarlatti, Alessandro (1659-1725). It. composer; and opera. 5 513.

Scarlet, Will. One of Robin Hood men in old legends. 6 116.

Scarlet Pimpernel. Flower. 3 101.

Scarlet Tanager, Amer. bird; and gipsy moths. 1-154.

Scaw Fell. See **Seafell**.

Scenery, theatrical. 3 121, 120 illus.

Seent, power of in dogs. 3 102.

Seent, used by women. See **Perfume**.

Seent spray, as form of jet pump. 6-307.

Sceptical Chymist, The. Work by Robert Boyle, pub. 1661. 2 316.

Sceptre. In Brit. crown jewels. 2-336 2 frontis.

Schaect [shahkht], Hjalmar Horace Greeley (b. 1877). Ger. economist. On the collapse of the mark (1923) introduced "Rentenmark" to stabilize currency. First pres. of Reichsbank in 1924. Minister of economic affairs 1934-37, afterwards minister without portfolio. Tried as a criminal, Nuremberg, 1945-46; acquitted. Tried by Ger. denazification court and sentenced; released on appeal.

Schafer method of artificial respiration 3-367 with illus.

Scharnhorst, Gerhard Johann Davi von (1755-1813). Prussian soldier, one of founders of Prussian military system (1809-13); fatally wounded at battle of Lützen.

Scharnhorst. Ger. battleship, sec. of name; completed 1939, displaced 26,000 tons; sank Brit. arm-

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merchant cruiser *Raunpindt* Nov. 23, 1939; damaged by aircraft, she was driven from Brest (where the *Garisnau* was being repaired) to La Pallice, returning later; both ships escaped up the Eng. Channel Feb. 12, 1942, the *Scharnhorst* being later bombed at Kiel and Altenfjord, Norway; on Dec. 26, 1943, she put to sea to attack a Russ.-bound Brit. convoy, was intercepted by 3 cruisers and hit below water by the *Duke of York*, and later torpedoed and sunk by the cruiser *Jamaica*.

Schaulen (Lithuania). See **Sialui**.

Schaumburg-Lippe. Former state in N. Ger.; area 131 sq. m.; merged into *Land of Lower Saxony* after 2nd World War.

Scheele, **Karl Wilhelm** (1742-86). Swedish chemist; discovered tungsten in form of tungstic acid, 7-324.

Scheer, **Reinhard von** (1863-1928). Ger. sailor; commander-in-chief of Ger. battle fleet in latter part of 1st World War; at battle of Jutland 4-390.

Scheffel, **Joseph Viktor von** (1826-80). Ger. poet and novelist (*Der Trompeter von Säckingen*; *Eckelard*).

Scheherazade [sheh-arazah'de]. In *Arabian Nights*, wife of the sultan and narrator of the tales, 1-196; also title of symphonic suite by Rimsky-Korsakov, and of a ballet by Fokine, 1-332.

Scheldt or **Schelde**. An important navigable r. of Belgium and the Netherlands rising in Fr. and flowing 250 m. to North Sea; French name, *Escaut*; Antwerp on, 1-419 illus.

Schelling [shel'ing]. **Friedrich Wilhelm Joseph von** (1775-1854). Ger. philosopher, 6-160.

Schenectady [shenek'tad'i], New York,

U.S.A. Industrial city on r. Mohawk, about 18 m. S.W. of Albany; mfrs. include motors, machine-shop products and electrical apparatus; pop. 91,785.

Schermuly Pistol. Projector for throwing life-saving rocket, 6-422.

Scherzo [skärt'sō], in music, 5-305.

Scheveningen. Suburb of The Hague and popular seaside resort of the Netherlands on North Sea, 5-372.

Schick test, for diphtheria; method discovered in 1913 by Bela Schick, Hungarian bacteriologist.

Schiedam [skhē'dahm], Netherlands. River port near mouth of Meuse; pop. 62,624; numerous canals; trade in grain.

Schiehallion. Mt. in Perthshire, Scot. (3,547 ft.), 6-138.

Schiffli Lace. See **Guipure Lace**.

Schiller [shil'er], **Ferdinand Canning Scott** (1864-1937); Brit. philosopher, exponent of pragmatism (*Riddles of the Sphinx*; *Humanism*); 6-160.

Schiller, **Johann Christoph Friedrich von** (1759-1805). Ger. poet and dramatist, 6-502, 4-13, 7-255.

Schilling. See **Money** (list).

Schiphol, Netherlands airport; h.q. of K.L.M. air lines, 1-141.

Schipperke [skip'perki]. Small tailless dog. Bred in Belgium as a watchdog on barges; height 12-13 in.; weight about 15 lb. Colour black.

Schleswig-Holstein. A *Land* of W. Germany, created 1915, incorporated former Prussian prov. of same name, and including several isls. in Baltic and North Seas. Area 6,047 sq. m.; pop. 2,500,000. Capital is Kiel; 4-3; history, 3-74, 1-474; 6-299.

Schliemann, **Heinrich** (1822-90). Ger. archaeologist; settled in Athens

(1868) and devoted himself to digging anc. sites. Excavated Troy, Mycenae, Thyrns and Orchomenos; excavations at Troy, 7-319, 1-25.

Schmalkalden [shmahkahl'den]. Tn. of E. Germany, in Thuringia; iron and steel mfg. centre; here Protestant princes of Ger. formed

Schmalkaldic League, 1530, to resist efforts of Charles V. to stamp out Protestantism, 6-377.

Schmidt, **Johannes** (1877-1933). Danish biologist; study of eels, 3-170.

Schnabel [shnahbel], **Artur** (1882-1951). Austrian pianist; world renowned in particular for his mastery playing of Beethoven's works.

Schneekoppe. Mt. in Bohemia, Czechoslovakia, (5,260 ft.), 1-504.

Schneider Trophy. International trophy, open to seaplanes of all nations. Presented in 1913 by Jacques Schneider, a Fr. patron of aviation;

discontinued after 1931 event, the trophy being won outright by Gt. Britain with speed of 340 m.p.h.

Schnitzler, **Eduard**. See **Emin Pasha**.

Schnorkel. Ger. "air tube" device for submarines; 7-175, 177 illus., 1-294.

Schoeffer, **Peter** (1425-1502). Ger. printer; and Gutenberg, 6-288.

Scholastica, **St.** Sister of St. Benedict, founded order of Benedictine nuns, 1-128.

Scholasticism. Medieval system of philosophy, 6-160.

Schönberg [shen'burg], **Arnold** (1871-1951). Austrian composer. Best-known works *Gurrelieder* (for orch. and chorus); *Pelléas et Mélisande* (symphonic poem); *Paradise Lost* (song cycle); his works broke away from accepted forms; 5-306.

Schönbrunn [shen'brunn]. Imperial palace near Vienna, Austria; treat-

SCHÖNBRUNN

LEADING WRITERS OF SCANDINAVIA

DENMARK

Carl Ludwig Emil Aarestrup (1800-56), poet—"Samlede Digte."

Hans Christian Andersen (1805-75), poet, novelist, and author of fairy tales—"The Ugly Duckling"; "The Tinder Box"; "Big Claus and Little Claus"; "The Dying Child"; "Only a Fiddler"; "In Spain."

Anders Christensen Arrebo (1587-1637), poet—"Hexameron" (poem in six books on the six days of creation).

Jens Immanuel Baggesen (1761-1826), poet—"Comical Tales"; "The Labyrinth"; "Parthenais."

Georg Brandes (1842-1927), critic—"Main Currents of Nineteenth Century Literature"; "Study of Shakespeare."

Holger Henrik Drachmann (1840-1908), novelist, dramatist, and poet—"Forskættet"; "Nanna"; "Muffled Melodies."

Johannes Ewald or **Evald** (1743-81), poet—"Adam and Eve"; "Balder's Death"; "The Fisherman."

Nikolai Frederik Severin Grundtvig (1783-1872), theologian and poet—"The Church's Reply" (protest against the rationalistic tendency of the day); "Roskilde Rhymes"; "Roskilde Saga"; "Northern Verses"; "A Handbook of Universal History."

Henrik Hertz (1708-1870), poet and dramatist—"Svend Dyring's House"; "King René's Daughter."

Ludvig Holberg (1684-1754), comic dramatist, satirical poet, and historian—"Peder Paars"; "The Pewterer Turned Politician"; "The Wavener"; "A History of Denmark."

Adam Gottlob Oehlenschläger (1779-1850), poet and dramatist—"The Golden Horns"; "Aladdin"; "Hakon Jarl."

Christiern Pedersen (c. 1480-1554), father of Danish literature—"translated" Christian III's Bible.

Henrik Pontoppidan (1857-1943), novelist and dramatist—"The Promised Land"; "The Kingdom of the Dead"; "Storeholt."

Saxo Grammaticus (12th century), historian—"Historia Danica."

Sigrid Undset (1882-1949), novelist—"Kristin Lavransdatter" (trilogy of 14th century life); "Olav Audunsson."

ICELAND

Gunnar Gunnarsson (1889-), novelist and poet—"Seven Days' Darkness"; "The Sworn Brothers"; "The Good Shepherd."

Snorri Sturluson (1179-1241), historian and poet—"Younger Edda"; "Heimskringla" (biographies of Norse kings).

Sturla Thordarson (1214-84), chronicler—"The Islanding Saga."

NORWAY

Bjørnstjerne Bjørnson (1832-1910), novelist, dramatist, and poet—"Arne"; "A Happy Boy"; "The Fisher Maid"; "King Sverre"; "Sagard the Bardar"; "The Editor"; "Dagbladet"; "In God's Way."

Knut Hamsun (1859-1952), novelist—"Hunger"; "Growth of the Soil"; "The Women at the Pump"; "Vaka-bonds"; "The Road Leads On."

Henrik Johan Ibsen (1828-1906), dramatist and poet—"A Doll's House"; "Ghosts"; "The Wild Duck"; "Hedda Gabler"; "The Master Builder"; "When We Dead Awaken"; "Brand"; "Peer Gynt."

Jonas Lauritz Enevold Lie (1833-1908), novelist—"The Visionary"; "The Commodore's Daughters"; "The Fairy Children"; "Grabow's Cat" (play).

Fridtjof Nansen (1861-1930), explorer and historian—"The First Crossing of Greenland"; "Esquimo Life"; "Farthest North"; "In Night and Ice"; "Spitzbergen"; "Norway and the Union with Sweden."

SWEDEN

Olaf von Dalin (1708-63), poet—"Saga om Hasten" (Tale of the Horse); "Svenska Friheten" (Swedish Freedom).

Per August Leonard Hallström (1896-), novelist and short story writer—"Wild Birds"; "An Old Story"; "The Diamond Ornament"; "New Tales."

Sven Anders Hedin (1865-1952), explorer—"From Pole to Pole"; "Southern Tibet"; "My Life as an Explorer"; "Riddles of the Gold Desert."

Carl Gustav Verner von Heidenstam (1859-1940), novelist and poet—"Enymion"; "Hans Allens"; "A King and his Campaigners"; "The Swedes and their Chieftain"; "Poems."

Ellen Key (1849-1926), feminist and educationist—"The Century of the Child"; "Idas"; "Lines of Life."

Par Fabian Lagerkvist (1891-), poet, dramatist, and short story writer—"Bödeln"; "Onda Säger."

Selma Lagerlöf (1858-1940), novelist—"Gösta Berling's Saga"; "Jerusalem"; "The General's Ring"; "Anna Svövd."

John Ludvig Runeberg (1804-77), poet—"The Elk Hunters"; "King Fjalmar"; "The Tales of Ensign Stål" (Contains Our Land, the national song of Finland).

Georg Stjernhlem (1598-1672), poet—"Kerules."

August Strindberg (1849-1912), novelist and dramatist—"The People of Hemso"; "The Life of the Skerry Men"; "Gustavus Vasa"; "Christmas"; "The Father"; "The Dance of Death."

Elias Tegner (1782-1846), poet—"Svea"; "Frithiof's Saga."

Schwyz [shvêts]. Swiss canton, area, 351 sq. m.; pop. 71,082; in medieval times a free community; gave name to Switzerland 7-213.

SCIATIC

Sciatic [sai'tik]. Nerves. Two mixed nerves, rising in nerve plexus in pelvis; great sciatic, the largest nerve in the body, 5-369 diag.

Science. Careers in, 2-228. *See also* sciences by name.

Science Museum, The, S. Kensington, London. First proposed by Albert, Prince Consort; opened in 1857; 5-300, 5-37.

Scilla or **Squilla**. Genus of about 100 species, bulbous perennials of fam. *Liliaceae*; 3 Brit. species: bluebell (*S. nutans*), the sea onion (*S. verna*), and the autumnal squill (*S. autumnalis*); the drug squills comes from a Mediterranean species.

Silly Isles. Group of isls. 25 m. W.S.W. of Land's End, Cornwall, Eng.; area 64 sq. m.; pop. 2,165; cap. Hugh Town; 5-509; daffodil field, 5-508 illus.

Scion [sai'on]. Plant shoot or bud for

grafting; on fruit trees, 3-478, 479 illus.

Sciotoville Bridge. Over Ohio r.; longest truss bridge, 3-64.

Scipio Africanus, the Elder (237-c. 183 B.C.). One of greatest Rom. generals; defeated Hannibal at Zama 202 B.C.; father of Cornelia, mother of the Gracchi.

Scipio Africanus, the Younger (c. 185-129 B.C.). Rom. general, adopted by the son of the elder Scipio Africanus; captured and destroyed Carthage (146 B.C.), 4-127.

Sclera. Outer coat of eyeball, 3-331 with diag.

Scott Lapps. People of Tibetan origin living in N.W. of Finnish Lapland, 4-447.

Scots [skotn]. Perthshire, cap. of the Picts in 8th cent. and long the coronation place of Scot. kings, 6-138; stone of, 2-509.

SCORPIO

See pas. (sk. sculptor of 4th cent. B.C.; said to have sculptured part of Mausoleum of Halicarnassus, 4-90)

Scopolamine [skopolamin] or **Hyoscin**. An alkaloid in deadly nightshade, thorn-apple and henbane; used as anæsthetic and "truth" serum.

Scops Owl. Type of owl living in Mediterranean countries, 6-12.

Score (music). *See Musical Terms*.

Scoreby, William (1789-1847). Brit. explorer and scientist, made his first trip to Greenland at the age of 11, and after 1810 made the voyage annually, published *An Account of the Arctic Regions*, in 1820; two years later abandoned the sea to continue his scientific studies, and in 1850 went to Australia, published *Magnetical Investigations*.

Scorpio, of **Scorpion**. One of the 12 signs of the zodiac, 7-524.

2,500 YEARS OF DISCOVERY AND INVENTION

A.D.

1819 Berzelius publishes a list of 50 elements.

1820 Oersted establishes the magnetic effect of an electric current.

1822 Arago measures the speed of sound.

1825 First steam railway opened (Stockton and Darlington).

1828 Ohm propounds his law of resistance in electrical circuits. Balard discovers bromine.

1827 Wohler separates aluminium. Brown announces his observations on the movements in liquids due to molecular motion (Brownian Movement).

1831 Faraday invents the dynamo.

1831 British Association for the Advancement of Science founded.

1832 McCormick invents the reaping machine.

1834 Faraday propounds his law of electrolysis of solutions. Dumas propounds his three laws of substitution in organic chemistry. Peltier discovers the thermo-electric effect.

1837 Daguerre invents his system of photography.

1837 Cooke and Wheatstone patent first electric telegraph.

1842 Ether first used as an anæsthetic. Mayer propounds his law of conservation of energy.

1843 Thurber invents first practicable typewriter. Joule's experiments in converting motion into heat confirm Mayer's law of conservation of energy.

1846 Adams discovers the planet Neptune.

1847 First use of chloroform in surgery.

1851 Kelvin and Clausius propound independently the second law of thermodynamics.

1852 Steam driven airship built by Giffard.

1856 Perkin makes the first aniline dyes.

1858 Darwin's *Origin of Species* states his theory of evolution. Cannizzaro compiles table of atomic and molecular weights based on hydrogen as 1.

1860 Swan invents the first practical electric lamp.

1860 Royal Aeronautical Society founded.

1867 Lord Lister publishes his principles of anti-septic surgery. Siemens-Martin invent the open-hearth system for making steel.

1869 Mendeleev establishes the periodic law of the properties of the elements.

1873 May invents the photo-electric cell.

1873 Temple discovers comet named after him.

1874 Discovery of D.D.T. announced.

1876 Graham Bell patents telephone.

1877 Pasteur proves the germ theory of anthrax and other diseases. Pictet and Calletet independently obtain liquid oxygen.

1878 Otto invents the gas engine.

1879 Stefan propounds the law of radiation of black bodies, and so establishes the science of optical pyrometry.

1881 Natural History Museum, London, opened.

1882 Pasteur proves that tuberculosis is caused by a bacterium.

1884 Parsons invents his steam turbine.

1885 Mergenthaler invents the linotype.

1887 Hertz demonstrates radio waves. Daimler builds the first petrol-engined motor car.

1888 Pasteur discovers and introduces method of inoculation against hydrophobia. Dunlop patents the first pneumatic tyre.

1889 Chardonnet manufactures the first artificial silk.

1892 Diesel invents the compression ignition engine.

1895 Marconi transmits the first message by radio. Röntgen discovers X-rays. Ramsay and Rayleigh discover argon in the atmosphere.

A.D.

1896 Becquerel establishes the presence of radio activity.

1897 Thomson discovers the electron.

1897 Sir Ronald Ross isolates malaria-carrying mosquito.

1898 Mme. Curie discovers radium.

1899 Rutherford discovers the radio active alpha, beta, and gamma rays.

1900 Planck propounds his quantum theory.

1901 Marconi sends first radio signal across Atlantic.

1903 Millikan and Kohlhorster make the first investigation of cosmic radiation.

1904 Fleming invents the thermionic valve.

1905 Einstein publishes his *Special Theory of Relativity*.

1906 Hopkins establishes that vitamins are essential to efficient diet. Baekeland invents Bakelite.

1911 Funk isolates vitamin A. Onnes liquefies helium.

1912 Laue establishes that X-rays are a form of radiation.

1913 Soddy defines isotopes: atoms with the same chemical properties but different atomic weights.

1914 Einstein publishes his *General Theory of Relativity*.

1920 Aston demonstrates that many elements are mixtures of isotopes, each having an atomic weight which is a multiple of one.

1923 Banting discovers insulin.

1926 Baird demonstrates his system of television.

1930 Tombaugh discovers the planet Pluto.

1931 Grey discovers heavy hydrogen (deuterium) and heavy water.

1931 First production of synthetic rubber (Neoprene).

1931 Professor Picard makes first manned balloon ascent into the stratosphere.

1931 Vitamin D first produced in pure crystalline state.

1932 Anderson discovers positron. Chadwick discovers neutron.

1941 First British jet-propelled aircraft flown.

1945 First man-made atomic explosion (Alamogordo U.S.A.).

1946 Carbon isotope (carbon 13) isolated.

1946 Radar contact with moon established.

1946 Waksman announces discovery of streptomycin.

1948 Cobalt 60 produced for use in treatment of cancer. First synchro-cyclotron built in Britain.

1949 Chicago university transmits mercury into gold. First British mechanical brain (electric calculating machine) completed. Antibiotic chloromycetin discovered. Cortisone (compound E) discovered. First rain-making experiments carried out in Britain.

1950 National Physical Laboratory, England, announces exact determination of the speed of light, 186,282 miles a second.

1951 First use in Britain of atomic energy for central heating. Atomic energy used to generate electric power in U.S.A. Hannane (insecticide) developed to prevent "swollen shoot" disease in cocoa plantations.

1952 First British atomic weapon exploded. Britain begins construction of first radio telescope. Nicholson discovers twelfth satellite of Jupiter.

1953 Mount Everest scaled for the first time.

1954 Submarine *Nautilus*, first atomic-powered ship, launched in U.S.A.

SCORPION

Scorpion. An arachnid, 6-609.
Scorpion grasses, 3-425.
Scotch Argus butterfly, 2-141 illus.
Scotch Brown Argus butterfly, 2-141 illus.
Scoters. A genus of sea ducks noted for diving powers.
Scotland. Country occupying N. part of Isl. of Gr. Brit.; area 30,405 sq. m.; pop. 5,095,969; cap. Edinburgh; 6-510; map, 6-511; flag, 3-385; thistle emblem, 7-270; physical features, 2-85, 86; products, 6-511; seed-potato production, 6-273; hydro-electric schemes, 4-217; bagpipes, 1-317; Bank holidays, 4-187; Church of Scot., 2-387; clans, 2-408; common land, 2-474; Court of Appeal, 2-521; dances, 3-37, 38 illus.; education, 1-9; fairs and folk lore, 3-337; Free Churches, 3-493, 164; Gaelic place-names, 3-467; golf, 4-44; harvest and Halloween customs, 4-134, 135; juries, 4-388; marriage laws, 6-135; New Year customs, 5-410; peatage, 6-108; police force, 6-252.
History 6-512; Gaels, 3-497; Roman expeditions in, 2-75; Sir William Wallace, 7-416, 6-512; Robert Bruce and Bannockburn, 2-96, 6-512, 1-365; medieval agriculture, 1-77; coal-mining, 2-429; first Gypsies, 4-110; battle of Flodden, 3-389; Knox and Reformation, 4-424; Mary Queen of Scots, 5-141; crown united with England's, 4-338; Montrose, 5-236; and Eng. civil war 3-278; union with England, 3-281.
Scotland Church of. See Church of Scotland.
Scotland, Language and Literature of, 6-513 3-284.
Scotland Yard. See New Scotland Yard.
Scots. Anc. people living in Ireland; settlement in W. of Scotland, 2-75.
Scot. Guards. Regt. of Brigade of Guards. Raised in Scotland in 1641 for Royal service in Civil War; disbanded 1651 and reformed in 1661 as Scotch Fusilier Guards, given present title 1877.
Scots mahogany. See Alder.
Scotsman, The. Daily newspaper printed and published in Edinburgh, 5-406; news by Teletypewriter, 4-519.
Scots pine. Tree 65-303, 7-310, 316 illus. f.

Scott, Charles William Anderson (1903-1946). Brit. airman; made record solo flights, England to Australia and back in 1931 and 1932, with Campbell Black won Melbourne race (1934), with Giles Guthrie won Portsmouth to Johannesburg race (1936).
Scott, Cyril Meir (b. 1879). Brit. musical composer and pianist; compositions for violin and piano, songs; discovered and scored many Eng. folk songs.
Scott, Elizabeth Whitworth (b. 1898). Brit. architect, became A.R.I.B.A.; designed Shakespeare Memorial Theatre, Marie Curie Hospital, and Newnham College.
Scott, Sir George Gilbert (1811-78). Brit. architect, responsible for much of the work done on Eng. cathedral and churches in early and mid-Victorian fever of "restorations"; designed Albert Memorial, London.
Scott, Sir Giles Gilbert (b. 1880) Brit. architect, grandson of above; responsible for restoration of Chester Cath.; designed Liverpool Anglican Cath., 4-525, 524 illus.; new debating chamber of House of Commons; president R.I.B.A. (1933-35).
Scott, Michael (1175-1234). Scot. mathematician, scholar, magician, and astrologer, attached to the court of Emperor Frederick II; legends associated with his name are current in the Scot. Borders and also on the Continent.
Scott, Robert Falcon (1868-1912). Brit. Polar explorer and scientist, 6-516, 6-214; diary, 3-86; at base camp, 6-510 illus.
Scott, Samuel (1710-72). Brit. artist, 3-261.
Scott, Sir Walter (1771-1832). Scot. novelist and poet, 6-517, 3-289, 5-472; and ballads, 1-351; *The Tattler*, 6-488; *Kenilworth*, 4-397.
Scottish Blackface sheep, 7-21 illus.
Scottish Bowling Association, 2-29.
Scottish Office. Brit. govt. dept. which administers Scottish affairs, 6-513.
Scottish Terrier. Dog, 3-100 illus. t.
Scott-Paine, Hubert (1890-1951). Brit. motor-boat designer in 1920 built first *Miss England* racing motor-boat; in 1933 reached 100 m.p.h. and in 1934 111 m.p.h. in a single engine boat.

SCUTCHING

Scouting for Boys. Book by Lord Baden-Powell, 2-33.
Scout Law, 2-34.
Scouts, Boy. See Boy Scouts.
Scranton, Pennsylvania, U.S.A., 3rd city of state; coal-mining and mfg. centre on Lackawanna r.; pop. 125,530; in chief anthracite region of U.S.A.; 6-119.
Screen-printing. Of textiles, 3-111
Screw, in mechanics, 6-158.
Screw, or Propeller. Device for propelling power-driven ships. Consists of two or more inclined blades, set on the end of a shaft rotated by the ship's engines. Rotation pushes the water away, so moving, or screwing, the boat forward. Blades usually of phosphor bronze or manganese bronze; 7-30.
Scribani [skri'ah'ben], Alexander (1872-1915). Russian composer and pianist, in his youth a concert virtuoso, later one of the most extreme innovators in composition; in his last work, *Prometheus*, he attempted to prove relationship between music and colour by using a "colour keyboard".
Scribe [skri'b], Augustin Eugène (1791-1861). Prolific Fr. dramatist, wrote some 400 plays noteworthy for sparkling dialogue and mastery of stage technique (*Adrienne Lecouvreur*, his best); wrote libretti for operas by Auber and Meyerbeer.
Scribes. Religious scholars of Jerusalem, the official copyists and exponents of the law of Moses; and Jesus Christ, 4-361.
Scriptorium. Writing room in a monastery, 2-3, 2 illus., 5-243 illus.
Seroggs, Sir William (1623-83). Eng. lawyer, Lord Chief Justice, his reputation is even worse than that of Judge Jeffreys (q.v.), would have been impeached for his conduct during the Popish Plot, but removed from the bench.
Scrolls of the Law. Documents kept in the Ark in every Jewish synagogue, 4-373 illus.
Sorum, in Rugby football, 3-416.
Soudry [skü'däri], Madeleine de (1607-1701). Fr. novelist, one of the leaders of Mme. de Rambouillet's brilliant salon; *The Grand Cyrus* a romance in 10 volumes, painted Fr. contemporary aristocracy under a classic disguise.
Soulling. Rowing by one or two men with a pair of sculls having blades more concave than ordinary racing oars. See Rowing.
Sculpins. Amer. name for fish with warted bodies, long spiny fins, and huge mouths, family *Colidae*, most of them inhabit rocky coast in N. regions and prey voraciously on small sea animals.
Sculpture, 6-519: Aztec, 1-333; Babylonian, 1-338 illus.; Colossal, 2-462; in anc. Egypt, 3-181, 186, 187, 188, 190, 191 illus.; Elgin marbles, 3-228, 229; Græco-Buddhist art, 4-249 illus.; Greek, 1-89; Indian, 4-215, 218 illus. in Ivory, 4-332; Japanese, 4-331 marble used for, 5-121. Negro 5-362 illus.; Persian, 6-129 illus. Roman, 6-410, 411-413 illus. Spanish, 7-112; Zulu, 1-63 illus.
Sounthorpe. Mfg. tn. of Lincs, Eng. pop. 54,254; 4-612.
Souppers. See Nautical Terms (list).
Sour vy. Disease in which blood spots appear under skin, gums bleed, and sufferer is prostrated by general weakness; preventives, 7-403, 404. Capt. Cook's measures against 2-495; caused by eating salted meat without green vegetables, 2-212.
Soutage, or Shield Money. In feudal times, money paid by a knight in lieu of military service to his overlord 4-162; and decline of feudalism 6-454.
Soutari (or Uskudar), Turkey. Suburb of Istanbul on E. shore of Bosporus, pop. 124,356; 4-304; Florence.
Nightingale at, 5-438.
Scutching. Process in cotton mill 2-517 illus.

SCOTTISH COUNTIES AND COUNTY TOWNS

COUNTY	COUNTY TOWN	AREA, Sq. m.	POP
Aberdeen	Aberdeen	1,970	308,055
Angus	Forfar	873	274,800
Argyll	Inveraray	3,110	63,270
Ayr	Ayr	1,130	321,184
Banff	Banff	630	50,135
Berwick	Duns	457	25,060
Bute	Rothsay	218	19,285
Caithness	Wick	985	22,705
Clackmannan	Clackmannan	544	37,528
Dumfries	Dumfries	1,072	85,656
Dunbarton	Dunbarton	246	164,263
East Lothian	Haddington	967	52,240
Fife	Cupar	900	306,855
Inverness	Inverness	4,210	84,024
Kincardine	Stonehaven	383	47,311
Kinross	Kinross	82	7,418
Kirkcudbright	Kirkcudbright	900	30,742
Linark	Linark	879	1,614,125
Midlothian	Edinburgh	370	565,748
Moray	Elgin	476	48,211
Nairn	Nairn	163	8,719
Orkney	Kirkwall	375	21,258
Peebles	Peebles	347	15,226
Perth	Perth	2,493	128,072
Renfrew	Renfrew	240	324,652
Ross and Cromarty	Dingwall	3,089	80,503
Roxburgh	Jedburgh	686	45,562
Seikirk	Seikirk	267	21,721
Shetland	Lerwick	550	19,343
Stirling	Stirling	451	187,432
Sutherland	Dornoch	2,028	13,664
West Lothian	Linlithgow	120	88,576
Wigtown	Wigtown	487	31,026

SCYLDINGS

Scyldings. Scandinavian people in *Beowulf*, 1-431.

Seylla and Charybdis. In Gk. legend, respectively a sea monster and a whirlpool on opposite sides of the narrowest part of the Strait of Messina; Odysseus and, 5-501.

Seyros [s'ros]. Small rocky isl. in Aegean off coast of Thessaly, connected in legend with Theseus and Achilles, 7-269.

Scythia [sith'ya]. Name applied by anc. Greeks to steppes s. of Black Sea inhabited by a nomadic people who disappear from history about 2nd cent. B.C.; craftsmanship, 5-447 with illus.

Sea: bathing and holidays, 1-384, 4-186; changes in geological time, 3-516; magnesium extracted from sea-water, 5-81; plant and animal life in 1-448, 5-127; temperature, 2-409; territorial waters, 4-459; force of waves, 2-51. *See also Ocean.*

Sea-anemone. Animal of the class *Anthozoa*, 6-524, 3 frontis., 1-157 illus., 5-127, 129 illus.

Seaborg, Glenn T. (b. 1912). Amer. chemist, worked on nuclear chemistry, experimented with plutonium, and in 1915 identified two new elements, americium and curium, artificial products of radio-activity.

Sea Bream. Fish found off Brit. coasts, not related to fresh-water bream, 2-55.

Sea Cadet Corps. 2-159.

Sea Coal. 2-129.

Seacombe. Township of Wirral, Cheshire, part of Wallacey bar., on Mersey, opposite Liverpool, 4-525.

Sea Cow. Mammal found in seas off New Guinea, 5-396.

Sea-cucumber. *See Trepang.*

Sea Dyaks. people of Borneo, child and parents, 2-340 illus.

Sea-eagle. Bird; foot, 1-171 illus.

Sea-elephant. 6-226, 525 illus.; in Antarctic, 1-169.

Sea Fan. Type of coral, 3 frontis.

Seaforth Highlanders. Highland regiment formed in 1881 by amalgamation of 72nd Foot (Duke of Albany's Highlanders) and 73rd Foot (Ross-shire Buffs), raised by Earl of Seaforth for service in Seven Years' War

Sea-horse. 6-524, 3 frontis.; protective coloration, 6-296 illus. f.

Sea Iguana. 4-235.

Sea-Island Cotton. 2-516

Seal. *See Seals.*

Sea Lace. Type of brown seaweed, 1-104 with illus. f.

Sea Leopard. 1-169.

Sea Lettuce. A green seaweed, 1-104 with illus. f.

Sealing Wax. 7-433.

Sea Lion. 6-525 with illus.

Sea Lords. In Brit. Admiralty, 1-20.

Seals. Sea mammals of the carnivore group, 6-525, 5-129, 5-102 illus.; in Antarctica, 1-169; food, 5-498; fur, 5-100, 3-496.

Sealyham Terrier. Dog, 3-103, 100 illus. f.

Seamen. in Merchant Navy, 5-172.

Sea-moss. Name sometimes given to Irish moss and to certain moss-like animals.

Séance [sāhns']. Fr. for "sitting"; used to denote a meeting, especially one held for the purpose of observing spiritualist manifestations.

Sea-nettle. Type of jelly fish, 4-360 illus. f.

Sea of Japan, Battle of. also called Tsushima, principal naval encounter of Russo-Japanese War, off isl. of Tsushima in Korea Strait (1905); the Russian fleet which had sailed from the Baltic was destroyed.

Sea-otter. A relation of the common otter, 6-11.

Sea-parrot. *See Puffin.*

Sea Perch. *See Bass.*

Sea Pink. *See Thrift.*

Searchlights. Powerful lights mounted so that the rays are collected almost in a single beam, for concentrating light on distant objects, used in military and naval operations, etc.; searchlights are also a part of anti-aircraft defence; 1-171.

Sea Scouts. 2-36 illus.

Sea-snakes. 7-75.

Seasons. 6-526; in Egyptian year, 3-184; equinox and solstice, 3-291; and rotation of Earth, 3-149.

Sea-trout. Term given to those trout which breed in rivers, spending rest of their time at sea like salmon; also known as salmon-trout; 7-319.

Seattle [sēat']. Largest city of the state of Washington, U.S.A. Spt.

SEDATIVES

and mfr. city on Puget Sound; pop. 467,390; 7-423.

Sea-urchin. Spiny animal that lives in the sand, among the rocks or on the bottom of the sea, 7-149, 151 illus., 3 frontis., 5-128 illus. f.

Seaweed. 6-526; as form of algae, 1-104; gathering for use as fertilizer, 1-105 illus. f.; iodine from, 4-276; burning for soda ash, 2-324 illus.

Sea-worms. 7-500.

Sebastian, St. (257-288). Rom. soldier and Christian martyr; patron against the plague; shot by archers, but recovered and later beaten to death, 5-139.

Sebastian (1554-78). King of Port. (succeeded 1557). Religious fanatic, killed in crusade against Moors; a superstitious Portuguese awaited his return down to present cent.

Sebastopol. *See Sevastopol.*

Secant. in trigonometry, 7-316.

Sechselauten. Annual spring festival in Zurich, 7-528.

Second. In time, the sixtieth part of a minute or 1-86,400th of a mean solar day. *See Weights and Measures.*

Secondary schools. types, 6-501.

Secondary System (geology). *See Mesozoic Age.*

Second Coalition. in Napoleonic Wars, 5-319.

Second Empire. in Fr. hist., regime of Napoleon III, 1852-71; 3-453, 5-323.

Secretary. carries on private or company secretary, 2-240.

Secretary Bird. 6-528.

Secretary of State. Chief officer in certain Brit. Govt. depts., e.g. home, foreign affairs, colonies, Commonwealth relations, Scottish affairs, war, air; usually member of the Cabinet; in U.S.A. Sec. of State is equivalent of Brit. foreign secretary.

Secret Inks. *See Sympathetic Inks.*

Section. of printed book, 2-1, 6.

Securities. in stocks and shares, 7-159.

Sedan. Town in N. Fr.; pop. 17,008; decisive battle in Franco-Prussian War (1870), 3-459, 5-185.

Sedan Chair. A means of transport popular in the 18th cent. It was an enclosed chair carried on poles by two bearers, fore and aft; invented at Sedan; 6-412, 110 illus., 4-353 illus.

Sedatives. in medicine, 4-134; in psychiatry, 6-299.

FAMOUS SCULPTORS AND THEIR MASTERPIECES

Bernini, Giovanni Lorenzo (1598-1680). Italian. ("Apollo and Daphne," "St Theresa," etc.)

Bologna, Giovanni da (1524-1608). Italian. ("Fountain of Youth," "Flying Mercury.")

Canova, Antonio (1757-1822). Italian. ("Amor and Psyche," "Venus," "Persons with the Head of Medusa")

Cellini, Benvenuto (1500-71). Italian. ("Perseus.")

Clodion (Claude Michel) (1738-1814). French. ("Nymph and Satyr")

Colombe, Michel (c. 1430 c. 1512). French. ("St. George and the Dragon.")

Coysevox, Charles Antoine (1640-1720). French. ("The River Dordogne," "The River Garonne.")

Dick, Sir William Reid (1879-). British. (Rosevelt Memorial, London, "Lady Godiva.")

Dobson, Frank (1887-). British. ("Truth," Portrait Busts.)

Donatello (1380-1400). Italian. ("David.")

Epstein, Sir Jacob (1880-). British. ("Night," "Rimur," "Weeping Woman," "Dolores," "Lazarus.")

Flaxman, John (1755-1826). British. ("St. Michael," "Marpessa.")

Frampton, Sir George (1860-1928). British. ("Petr Pan.")

Frémiet, Emmanuel (1824-1910). French. ("Gorilla and Woman.")

Gaudier-Brzeska, Henri (1891-1915). French. ("The Dancers," "The Embracers.")

Ghiberti, Lorenzo (1378-1455). Italian. (Doors of Baptistry, Florence)

Gilbert, Sir Alfred (1851-1934). British. ("Eros.")

Gill, Eric (1882-1940). British. (Figures at Broadcasting House, London)

Goujon, Jean (c. 1520-60). French. ("Diana and the Stag.")

Houdon, Jean (1740-1829). French. (Many portrait busts.)

Jagger, Charles Sargeant (1885-1934). British. (Royal Artillery Memorial, London)

Lysippus (c. 390 B.C.). Greek. ("Heracles.")

Maillo, Aristide (1861-1944). French. ("Baigneuse Accoudee.")

Mestrovic, Ivan (1883-). Yugoslav. ("Self-Portrait," "Annunciation.")

Michelangelo B. varroti (1475-1564). Italian. ("L. n.," "Tomb of Medici," "The Captive," "Moses.")

Miles, Carl (1875-1955). Swedish. (Large fountain groups.)

Montanes, Juan (1570-1640). Spanish. ("Virgin of the Immaculate Conception.")

Moore, Henry (1898-). British. ("Three Standing Figures," "Madonna and Child.")

Myron (c. 500-410 B.C.). Greek. ("Discobolus.")

Phedias (c. 490-432 B.C.). Greek. ("Statue of Zeus.")

Pigalle, Jean Baptiste (1714-85). French. ("Mercury.")

Pisano, Giovanni (1250-1320). Italian. ("Madonna and Child.")

Polyclitus (c. 480-412 B.C.). Greek. ("Spear Bearer.")

Pollaiuolo, Antonio (1429-98). Italian. ("The Young Warrior.")

Praxiteles (c. 460 B.C.). Greek. ("Hermes Bearing Infant Dionysus.")

Puget, Pierre (1620-94). French. ("Milo of Crotona.")

Quercia, Jacopo della (1371-1438). Italian. ("Crucifix of Eve.")

Rauch, Christian Daniel (1777-1857). German. ("Joseph Maximilian.")

Robbin, Andrea della (1435-1523). Italian. ("St. Francis and St. Dominic.")

Robbia, Luca della (1399-1462). Italian. ("Singing Boys.")

Rodin, Auguste (1840-1917). French. ("The Kiss," "The Thinker.")

Rude, François (1784-1855). French. ("Jeanne d'Arc.")

Saint-Gaudens, Augustus (1818-1907). American. ("Lincoln.")

Sansovino, Jacopo (1486-1570). Italian. ("Apollo.")

Scopas (c. 370 B.C.). Greek. ("Demeter.")

Stevens, Alfred (1818-75). British. (Monument of Duke of Wellington, St. Paul's Cathedral.)

Thorvaldsen, Bertel (1770-1844). Danish. ("Adonis.")

Torrigiano, Pietro (1172-1522). Italian. (Tomb of Henry VII, Westminster Abbey, London.)

Verhuggen, Henrik (1855-1924). Dutch. (Pulpit in Brussels Cathedral.)

Verrocchio, Andrea del (1435-89). Italian. (Colleoni Monument, Venice.)

SEDCEMOOR

Sedgemoor. Barren tract near Bridgewater, Somerset, where troops of James II defeated Monmouth (1685); called "last battle fought on English soil"; 7-84, 85.

Sedges. Members of the family *Cyperaceae*, of the grass order; distinguished from grasses by triangular, not cylindrical, stem; usually of stiff, erect growth, and found in cool, damp places; Eng. examples include true bulrush, *Scirpus lacustris*, 2-124, 123 illus.; and members of genus *Carex*; the papyrus sedge is *Cyperus papyrus*.

Sedge Warbler. A song-bird, 7-419; migration, 5-204 illus. f.

Sedgman, Frank (b. 1927). Australian tennis player; Wimbledon champion, 1952, 4-482.

Sediment. on ocean floor, 5-498.

Sedimentary rocks. 6-424, 3-515, 4-509.

Sedley, Sir Charles (c. 1658-1701). Eng. dramatist, wit and rake; comedy *Brilliana* is his best work; 3-286.

Seebeck Effect. Phenomenon in electricity whereby if two wires of different metals are joined at their ends to form a circuit and the two junctions are maintained at different temperatures, a current flows round the circuit. Discovered in 1820 by the German physicist Thomas Johann Seebeck (1770-1831). The Seebeck effect is the basis of the thermocouple used for measuring minute temperatures, 7-268.

Seedless orange. 5-521.

Seeds and Spores. 6-528; 6-216; flowers and, 3-395; germination, 6-217 illus.; in plant anatomy, 2-25 illus. f. See also names of individual plants.

Seeley, Sir John Robert (1831-95). Brit. historian; professor of mod. history at Cambridge (1869-95). Chiefly remembered for his *Ecce Homo*, a study of Jesus Christ. Other works were mainly historical studies.

Seghers, Hercules (c. 1590-1610). Dutch painter, 5-384.

Segovia [sə'gɔviə]. Small city 40 m. n.w. of Madrid, Spain; pop. 16,500; medieval religious centre and seat of Castilian court; aqueduct, 1-190, 189 illus.; cathedral, 7-109 illus.

Segrave, Sir Henry O'Neal Dehane (1896-1930). Brit. racing motorist. Reached 231-364 m.p.h. in his car *Golden Arrow* in 1929. Killed on Lake Windermere in his motor boat *Miss England II*, after establishing a world motor boat speed record.

Segu or Segou. Tn. of Fr. Sudan on r. Niger, formerly cap. of native Mahomedan kingdom; pop. 22,150.

Segura [sə'gʊrə]. A r. of S.E. Sp.; 150 m. to the Mediterranean.

Sehna Knot. In carpet mfr., 2-218, 218 diag.

Selditz Powders. Laxative medicine composed of tartaric, or other solid acid, and a bicarbonate, which effervesces when added to water (named from Selditz, a vil. in Bohemia).

Selma R. of Fr., rising in the Langres plateau and flowing 482 m. to Eng. Channel, 6-530, 3-133; canal connexion w/ Rhine, 6-395; Paris on, 6-79.

Seismograph [sɪz'mɒgrəf]. Instrument for detecting earthquake vibrations, 3-153 with illus.

Selangor. State of the Federation of Malaya; area 3,160 sq. m.; pop. 710,788; 5-94.

Selborne. Vil. of Hants, Eng.; birthplace of Gilbert White, author of *The Natural History of Selborne*; 4-123.

Selborne Society. Formed in 1885 as the Selborne League, for the preservation of birds, plants, and pleasant places.

Selden, John (1584-1654). Eng. lawyer and scholar; active in political life but chiefly remembered for his *Table Talk*, an entertaining miscellany in essay form.

Selden Society. Group founded by F. W. Maitland in 1887 for study of history of Eng. Law.

Selene [sɛl'ɪnɪ]. Gk. moon-goddess, later identified with Artemis.

Selenite. Transparent varieties of gypsum, 4-112.

Selenium (Se). Non-metallic element, atomic no. 34, atomic weight 78.96; 6-530, 3-224; barrier cell, 6-169; in photo-voltaic cell, 6-164.

Selenium cell. 6-163; and television, 7-251.

Selucia [sɛl'ʊʃiə]. Babylonia. Anc. city on Tigris, s. of Baghdad; centre of Gk. culture in Babylonia; destroyed by Romans (2nd cent. A.D.). Seleucid dynasty, Syria (312-64 B.C.); founded by Seleucus Nicator, son of one of Alexander's generals.

Sell-heal. Perennial herb (*Prunella vulgaris*) of order *Labiatae*; formerly supposed to heal wounds, etc.

Self-propelled guns. In 2nd World War, 1-260.

Selim I (1467-1520). Sultan of Turkey; conquered Persians and Armenians; annexed Egypt in 1517, 7-331.

Seljuks. Turkish family descended from a chieftain named Seljuk, whose branches ruled most of w. Asia 11th to 13th cent.; rule in Persia marked by literary and artistic revival; superseded by Ottoman dynasty about 1500; 6-132.

Selkirk, Alexander (1676-1721). A Scot. sailor, the original of Robinson Crusoe, 3-2.

Selkirk, Thomas Douglas, 5th Earl of (1771-1820). Scot. nobleman interested in colonization of Canada; founded Red River Settlement, Manitoba.

Selkirk. Co. tn. of Selkirkshire, Scot.; pop. 5,853; 6-531.

Selkirk Mts. Range in Canadian Rockies, Brit. Columbia; highest peak 10,645 ft.; 2-80.

Selkirkshire. Co. of Scot.; area 267 sq. m.; pop. 21,724; co. tn. Selkirk; 6-531.

Sellafield. Cumberland, England; site of an atomic energy installation, 3-10.

Selous [sɛl'ʊs]. Frederick Courtenay (1851-1916). Brit. explorer of S. Africa, ethnologist, and daring big-game hunter; secured Mashonaland territory for Brits in 1890.

Selsey Bill. Promontory in s.w. Sussex, stretching for 6 m. s. of Chichester; off Selsey town, at tip of Bill, were remains of older town and cathedral submerged by the sea; 3-217.

Selwyn College. Cambridge. Founded (1882) in memory of George Augustus Selwyn (1809-78), first bishop of New Zealand (1811), later bishop of Lichfield; 2-182.

Semangs. Aboriginal people of Malaya 5-91.

Semaphore. In signalling, 7-51, 52 illus.

Semele [sem'ɪlə]. In Gk. myth., mother of Dionysus.

Semeru, Mt. Highest peak in Java (over 12,000 ft.), 4-355.

Semi-colon. In punctuation, 6-309.

Seminoles ("Separatists"). Tribe of N. Amer. Indians, originally part of Creeks; separated from tribe and settled in Florida, U.S.A.

Semiramis [sem'ɪrəmis]. Assyrian queen, in legend, half-divine wife and successor of Ninus, founder of Nineveh; herself great conqueror and ruler.

Semitic languages. Group of languages separate from the Indo-European family, 4-151, 4-145, 6-158; Phoenician alphabet, 1-120 with illus.

Semitic races. Collective term for group of Eastern peoples classified according to language rather than by blood. Southern Semites include Arabs and Abyssinians; Northern Semites include Jews. Traditionally the group is descended from Shem, son of Noah.

Sen. See Money (list).

Senanayake, Don Stephen (1884-1952). Sinhalese statesman. First prime min. of Ceylon, 1947-52; 2-298.

Senate. of anc. Rome, 6-430; Australian, 1-318.

SERBIA

Sendai, Japan. City near E. coast of Honshu Isl. 100 m. N.E. of Tokyo; pop. 219,545; silk and lacquer mfrs.

Seneca [sen'ekəl]. Lucius Annaeus (c. 4 B.C.-A.D. 65). Rom. statesman, philosopher, and dramatist, 3-116, 4-451; and Nero, 5-367.

Seneca. Amer. Indian tribe, 5-421.

Senefelder [zə'nefeldər]. Alois (1771-1834). Inventor of lithography, 5-395.

Senegal [senegawl']. Territory in Fr. W. Africa, bordering Atlantic; area 77,730 sq. m.; pop. 1,999,000; cap. St. Louis; exports peanuts, hides, gums; 7-400, 401 illus.

Senegal. R. in Fr. W. Africa; flows 1,000 m. N. and W. to Atlantic.

Senegambia. Indefinite territory in French West Africa between the Senegal and Gambia rivers, extending from the Guinea coast.

Senior airframe man. in R.A.F., insignia 6-462 illus.

Senior technician. in R.A.F., insignia 6-462 illus.

Senlac. Name given by some historians to site of battle of Hastings (1066) 7-451.

Senlis [sahn'li]. Fr. Small city, 25 m. N. of Paris; Gaulo-Rom. wall-medieval cathedral.

Sennacherib [senək'ərib]. Assyrian king (reigned 705-681 B.C.), great builder and warrior, 1-335; captured and razed Babylon, built Ninveh, 1-338, 5-410; defeated by Hezekiah, 4-373.

Sennar Dam. On the Blue Nile, Sudan, 3 m. above the tn. of Sennar, 7-190, 5-440.

Sennett, Mack (b. 1884). Amer. film producer; and Chaplin, 2-304.

Sens [sahn's]. Fr. Industrial city on r. Yonne, 65 m. S.E. of Paris; pop. 17,300; Rom. remains; cath. of St. Etienne.

Sensitive plants. Species the leaves of which, as in some of the mimosa, close on being touched, 4-470.

Sentence. in grammar, 6-531, 4-54.

Senusi. A fanatical ascetic Mahomedan sect centred on the oases of southern Libya; founded in 1837 by the Sheikh es-Sennusi.

Seoul [sə'ʊl] or Keijo-fu. Cap. of Repub. of S. Korea, near r. Han, 11 m. from Yellow Sea; pop. 1,141,776; native manufactures of silk, paper, tobacco, 4-426.

Sepal. of flowers, 3-399, 400, 4-472.

Separatists. Puritan sect later known as Congregationalists, 6-312.

Sepia. Brown ink originally obtained from glands of cuttle-fish, or squid, now made from juice of walnuts, 4-262.

September. 9th month of the year; in Rom. calendar, 5-255.

Septic tank. A receptacle for sewage in which the organic substances are decomposed by the action of bacteria.

Septimius Severus. See Severus, Lucius Septimius.

Septuagint [sep'tʊdʒɪnt]. A Gk. version of Hebrew Bible, made according to tradition in 3rd cent. B.C. by about 70 translators (Lat. *septuaginta* "seventy"), 1-442.

Sequoia. See Wellingtonia.

Sequoia National Park. Calif., U.S.A. In Sierra Nevada Mts., 160 m. N. of Los Angeles; area 161,597 acres established (1890) to preserve the sequoias.

Seraglio [serah'lyə]. The old palace of the sultan of Turkey at Constantinople; name also used as synonym with "harem," 4-304.

Serajevo. See Sarajevo.

Seraph, H.M.S. Brit. submarine, 7-17.

Seraphim [sə'rafiɪm] or Seraphs. Guardians of the threshold of the Most High (Isa. vi. 2-6); in later Christian and Jewish lore, highest angelic order.

Serbia. Prov. of Yugoslavia, formerly an independent kingdom (1878-1918), 6-532; and Turkey, 7-330.

in 1st World War, 3-316, 7-18, 7-478; fused with Montenegro, 7-483, 7-617, 518.

SERDICA

Serdica. Anc. tn. on site of which Sofia now stands, 7-82.
Serfdom. In Middle Ages, 3-348, 7-65.
Serge. cloth, 2-419 illus.
Sergeant (ser'jant). In Brit. Army, and R.A.F. a non-commissioned officer ranking next above corporal.
Sergeant. in R.A.F., insignia, 6-462 illus.
Sergeant-major. In Brit. Army, a warrant-officer rank.
Serlein. Sticky gum produced by silkworm, surrounding the fibroin or raw silk; removed during silk mfr., 7-54.
Series. in mathematics, 6-532.
Series. In electrical engineering, 3-212 diag.; of cells, 1-387; in electric motor, 5-276.
Seringapatam. Tn. in Mysore, India, on an isl. 3 m. long, 8 m. N. of Mysore city; from 1610 to 1799 the cap. of Mysore; the fort was built by Tippoo Sahib, who was killed in defending it against the British in 1799.
Serous Membranes. Membranes forming closed sacs and moistened with a serous fluid; they line certain cavities of the body: the pleurae, the peritoneum, and the pericardium are examples.
Serowe. Largest tn. in Bechuanaland Protectorate, pop. 15,900, 7-89.
Serpent. Early horn instrument, 5-309.
Serpent. legend of serpent's pattern, 4-418.
Serpentine. A mineral consisting of hydrated magnesium silicate, ranking in colour from green to brown and sometimes yellow or red, 4-336.
Serpentine. Artificial lake in Hyde Park and Kensington Gardens, London. Used for boating, and, since 1930, for ice skating, 5-22 map, 26.
Serpula. A sea-worm, 7-500.
Serra da Estrella. Mt. range in Portugal, 6-267.
Serrate. Botanical term for leaves with saw-like edges, 4-471.
Serrated Wrack. A brown seaweed, 1-105, 101 illus. f.
Serum. Colourless, watery fluid from tissues or organs of the body; esp. used of blood serum—the watery substance which remains after blood has clotted; blood serum of immune animals used as protection against disease in vaccination, etc., 1-190.
Serval. A large, long-legged S. African wild cat (*Leptis serval*) 3 ft. or more long, with yellow fur spotted and banded with black; the tail is 15 in. in length, 2-263.
Servetus, Michael (1511-53). Span. physician (approached discovery of circulation of blood) and theologian; burnt by Calvin for heresy, 3-498, 2-179.
Service, Robert William (b. 1874). Anglo-Canadian poet; sometimes called the Canadian Kipling (*The Spell of the Yukon, Rhymes of a Rolling Stone*; autobiography *Ploughman of the Moon*), 2-203.
Servus Tullius (578-534 B.C.). 6th king of Rome, 6-429.
Sesostriis [sesos'tris]. Gk. name of legendary Eg. king and world-conqueror.
Sessile. In botany. name given to type of leaf which has no stalk, but is attached directly to the stem of a plant; flax, 4-470, 471 illus.
Sestet. Last six lines of a sonnet, 6-234.
Sestos. Anc. tn. in Thrace, on Hellespont; w. terminus of Xerxes' bridge; home of Hero, 4-170.
Set. In anc. Egyptian myth., brother and murderer of Osiris, 6-6.
Set. In lawn tennis, 4-460.
Seti (sā'tē) I (c. 1300 B.C.). Eg. pharaoh of 20th dynasty; built much of temple of Karnak, 3-200.
Seto (sā'tō). Japan. Tn. near Nagoya, famous for pottery.
Seton, Ernest Thompson (1860-1946). Eng.-born Canadian naturalist and author (*Wild Animals I Have Known, Lives of the Hunted; Animal Heroes*); founded Woodcraft League, an American movement correspond-

ing in many ways to the Boy Scout organization.
Setter. Breed of game-dog, trained to crouch down when marking game, 3-102.
Settlement. See Stock Exchange Terms.
Settlement, Act of. Passed by Eng. parliament (1701), to settle crown of Gt. Brit. on the electress Sophia of Hanover and her heirs, if Protestant; and Queen Anne, 1-159.
Setubal. Spl. and city of Portugal, 20 m. S.E. of Lisbon; pop. 44,030; exports wine, fruit, salt, cork.
Seurat, Georges Pierre (1859-91). Fr. painter, 4-237, 3-449.
Seyastopol. Russ. naval station on Black Sea in S.W. Crimea, Ukraine S.S.R.; pop. 112,000, 2-532; built by Potemkin, 6-474.
Seven Lamps of Architecture. The (1849), book by John Ruskin, 6-471.
Seven Pillars of Wisdom. The (1926). An account of his Arabian experiences by T. E. Lawrence, 4-462.
Seven Sisters. The. Series of chalk cliffs on Sussex coast, 7-197 illus.
Seven Sleepers. In medieval legend, 7 Christian youths of Ephesus who during persecution under Emperor Decius in 3rd cent. hid in cave and there fell into a miraculous sleep that lasted nearly 200 years.
Seventh Day Adventists. Christian sect believing in the second coming of Christ in person, and observing the seventh day as Sabbath.
Seven Wonders of the World. 7-1; Colossus of Rhodes, 6-393; hanging gardens of Babylon, 1-336, 337 illus. f., 339.
Seven Years' War (1756-63), 7-2; and Amer. independence, 1-137, 6-120; Maria Theresa, 5-125; Pitt and, 2-310; Prussia in, 4-8.
Seyern. R. of Eng. and Wales, 220 m. long, rising in Plynlimmon and flowing into Bristol Channel, 7-4, 3-247, 2-88, 5-231; hydro-electric scheme, 4-217.
Seyern. R. of N.W. Ontario; flows 350 m. through Lake Seyern to S.W. side of Hudson Bay, 4-200.
Seyern Bridge. 7-5.
Seyern Tunnel. Rly. tunnel partly beneath R. Seyern, linking Bristol and Cardiff, constructed between 1873 and 1886, 7-328, 6-357.
Seyern Wildfowl Trust. Slimbridge, Gloucestershire, 4-47.
Severus, Lucius Septimius (146-211). Rom. soldier-emperor, raised to throne by provincial legions in spent reign chiefly in warfare; rebuilt Hadrian's wall in Britain, 2-75; beard, 1-397 illus.; triumphal arch, 6-127 illus.
Sévigné (sāvēnyā), Madame de (1626-96). Fr. writer, 3-455.
Seville. City in Andalusia, Spain; pop. 374,138, 7-5; religious dancing, 1-351.
Seville Orange. marmalade made from, 5-521.
Sèvres (sā'vr). Suburb of Paris; pop. 15,240; treaty between Allies and Turkey in 1920, 7-484; famous for porcelain, 6-277.
Seward, William Henry (1801-72). Amer. statesman, sec. of state under Lincoln and Johnson; active Abolitionist; a founder and leader of Republican party; purchase of Alaska, 1-88.
Sewell, Mary (1751-1881). Brit. writer for children; her daughter Anna (1820-78) wrote *Black Beauty*, the autobiography of a horse.
Sewing. 7-6; in book-binding, 2-6, 9 illus.; embroidery, 3-237; needles, 5-361.
Sewing Machine. 7-8.
Sexagesima. In Christian calendar, the Sunday eight weeks before Easter.
Sext. Canonical hour of prayer in R.C. Church, 5-244.
Sextant. Navigational instrument, 5-338, 339 illus., 4-452.
Sextet. in music, six singers or players, or a composition for six parts.
Sexual Reproduction. See Reproduction.
Seychelles (sāshel'). Group of isls. belonging to Brit., in Indian Ocean

SHAKESPEARE

about 750 m. N.E. of Madagascar. Comprises 93 isls. and islets; area 156 sq. m.; pop. 36,000. Mahé is the chief isl. Copra, guano, vanilla, and coconut oil exported.
Seyhan (Turkey). See Adana.
Seymour. Family name of the dukes of Somerset.
Seymour, Jane (c. 1509-37). 3rd queen of Henry VIII, 1-506, 4-164.
Seymour, Robert (c. 1800-36). Brit. illustrator drew first 7 plates of original edition of *Pickwick Papers*, 3-86.
Seymour (of Sudeley), Thomas Seymour, Baron (c. 1508-49). Eng. admiral; married Henry VIII's widow Catherine Parr; and Lady Jane Grey, 4-97.
Seyun. City of Arabia, 1-194 illus.
Slax. Spl. of Tunisia, on N. shore of Gulf of Gabes; olive oil and phosphates exported; pop. 54,650; 7-324.
Storza (sfort'saz). Famous It. family; founded by a peasant condottiero whose son, Francesco Storza (1401-66), conquered duchy of Milan and founded line of Storza dukes; 5-205, 4-313.
Storza, Count Carlo (1873-1952). It. statesman; min. foreign affairs, 1921-22; ambassador, France, 1922; anti-Fascist exile (1926-43); min. foreign affairs (1947-51).
Storza, Giovanni (15th cent.). It. nobleman; marriage to Lucrezia Borgia, 2-18.
Storza, Lodovico (1451-1508). Member of famous It. family who were dukes of Milan (1450-1535); Leonardo in service of, 4-483.
's Gravenhage (skrah'enhage). Formal Dutch name for The Hague (q.v.).
Shackleton. See Nautical Terms (q.v.).
Shackleton, Sir Ernest Henry (1874-1922). Brit. sailor and Antarctic explorer, 7-10, 6-244.
Shackleton ice-sheet. Antarctica, 1-161.
Shad. A fish of the herring family, the two European species of which are the allis and the fluke; formerly common in the Thames, 4-172.
Shaddock. Citrus fruit of the same family as the grapefruit, 4-61.
Shadool. Primitive water-raising device used on the Nile delta, 3-178 illus.
Shadwell, Thomas (c. 1612-92). Eng. poet laureate and playwright, chiefly remembered for quarrel with Dryden who satirised him in *MacFlecknoe* (But Shadwell's wit deviates into sense); 3-286, 6-232.
Shaft. In architecture, that part of a column between capital and base.
Shaftesbury, Anthony Ashley Cooper, 1st Earl of (1672-83). Eng. statesman; in Civil War fought first for king, then for Parl.; member of famous Cabal; lord chancellor.
Shaftesbury, Anthony Ashley Cooper, 3rd Earl of (1671-1719). Celebrated moral philosopher, grandson of preceding (*Characteristics of Men, Manners, Opinions, and Times*).
Shaftesbury, Anthony Ashley Cooper, 7th Earl of (1801-85). Brit. politician, philanthropist, and social reformer, 7-11; and lunacy laws, 5-165.
Shaftesbury Memorial, London. 7-346.
Shag. A sea bird, 7-11; feeding young, 1-169 illus.
Shaggy Pholiota. a fungus, 3-488 illus. f.
Shagreen. Leather made from skin of sharks, 7-18.
Shah Jehan [shah je'hahn] or Jahan (d. 1666). Mogul emperor of Delhi; founder of modern Delhi; dethroned (1658) by his son Aurangzeb; built Taj Mahal, 4-249, 7-220 illus. f., 1-69, 3-16.
Shakers. Name given, originally in derision, to religious sect (offshoot of Eng. Quakers) officially called "United Society of Believers in Christ's Second Appearing"; founded by Ann Lee, who emigrated to Amer. with followers in 1774.
Shakespeare, William (1564-1616). The greatest of Eng. poets and dramatists, 7-12; portrait, 7-13 illus.; in Eng. literature, 3-285; and Bacon, 1-341; chronology of plays, 7-15;

and Jonson, 4-382; sonnet, 6-231; and Stratford-upon-Avon, 7-171; *theatres of his time*, 7-285; his will, 4-372.

Plays: As You Like It, 1-285; *Hamlet*, 4-122; *King Lear*, 4-409; *Macbeth*, 5-01; *The Merchant of Venice*, 5-173; *A Midsummer Night's Dream*, 5-200; *Othello*, 6-9; *Romeo and Juliet*, 6-419; *The Tempest*, 7-250; *Twelfth Night*, 7-339.

Shakespeare, Tales from. Shakespeare's plays put into story form by Charles and Mary Lamb, 4-111.

Shakespeare Memorial Theatre. Stratford-upon-Avon. Scene of annual Shakespeare festival, 7-171 illus., 7-265.

Shale. Rock-like clay which has hardened in layers to form a slate-like stone; in brick-making, 2-58; petroleum in, 6-147.

Shalimar Bagh. Famous garden in the Vale of Kashmir, 4-391 illus.

Shallot. Variety of onion, 5-512.

Shamanism [shah'maniz'n]. A primitive religion of various N. Asiatic peoples; teaches that all good and evil comes from spirits, which can be influenced only by priests called "shamans."

Shamrock. Species of clover, adopted as the emblem of Ireland, said to have been used by St. Patrick to illustrate the doctrine of the Holy Trinity, 7-15, 6-96.

Shan. Burmese name for the people of the Burmese Shan state and of a group of tribes on the Burma-Shan-Chinese border. The Burmese Shans formerly peopled 13 states under British rule. In 1948 these states became a part of the union of Burma.

Shang dynasty (1766-1122 B.C.). Rulers of China; decoration and design, 2-363.

Shanghai. Chief spt. of N. China, at mouth of Yangtze r.; pop. 5,407,000; 7-16; Gordon and Taping revolt, 4-14; the Bund, 7-16.

Shank or Cannon-bone of horse, 4-196 diag.

Shannon. R. of Ireland, 160 m. long, 7-16; 4-281; hydro-electric plant, 4-285.

Shansi. A N.-cent. prov. of China; a. 60,000 sq. m.; pop. 11,601,000; cap. Yangchi; coal, iron, copper, salt, fruit.

Shantung. Prov. on e. coast of China, area 69,200 sq. m.; pop. 40,503,000, 7-17.

Shantung silk. 7-17, 7-51.

Shap Fell. Upland tract in Westmorland, between mts. of Lake Dist. and Pennine Chain; traversed by road and main l.y. line.

Shareholder or Stockholder. See *Stock Exchange Terms*.

Shari. R. in Africa, with its windings, 1,100 m. long; flows to Lake Chad.

Sharks. 7-17, 3-369 illus.; eggs, 3-172, 171 diag.; in Lake Nicaragua, 5-130.

Shar'on, Plain of. Fertile plain in w. Palestine on Mediterranean coast between Jaffa and Caesarea.

Sharp, Cecil (1859-1921). Brit. composer, famous for his collections of folk songs, country dances, etc., 1-351.

Sharp, William (1856-1905). Brit. poet and novelist; wrote many poetical and critical works under his own name; best known as author of stories and sketches of the primitive Celtic world under the name of "Fiona Macleod," the secret of whose authorship he kept until his death.

Shasta, Mt., Calif., U.S.A., peak in Sierra Nevada Mts., near N. boundary, 14,380 ft.

Shatt-el-Arab. Name of the Euphrates after its junction with Tigris; flows s.e. 120 m.; 3-306, 7-277, 4-278, 279 illus.

Shaving. methods of, 1-397.

Shaving soap, manufacture, 7-80.

Shari (Lithuania). See *Sialia*.

Shaw, George Bernard (1856-1950). Brit. dramatist, critic, and essayist, 7-19, 3-201; and Chesterton, 2-332; and realist drama, 3-122; proposed phonetic alphabet, 7-130.

Shawcross, Sir (William) Hartley (b. 1902). Brit. lawyer and politician; attorney-gen. 1945-51; chief prosecutor for Brit. at Nuremberg trials. Pres. of Board of Trade in 1951.

Shawenagan, or Shawinigan, Falls, Quebec, tn. on St. Maurice r. 20 m. above Three Rivers; pop. 26,903; falls, 150 ft. high, furnish water-power for mfrs. of aluminium, manganese, carbide.

Shawms. Early reed instruments. Elizabeth I and the Royal Shawms, 5-309.

Shawnee, or Shawano, Indians. Tribe of N. Amer. Indians of Algonquian stock; originally lived in Wisconsin, U.S.A., but in 17th and 18th cents. were several times defeated by Iroquois and driven principally to S. Carolina and Tennessee; now in Oklahoma.

Shay locomotive. Type of locomotive, 5-13.

Shays's Rebellion. Rising in Massachusetts, U.S.A., in 1786-87, headed by Daniel Shays, due to oppressive taxation and weak govt.

Shearing, of sheep, 7-474.

Shearwaters. Sea birds, 7-20.

Sheath. In botany, name given to the lower part of the leaf folded round the stem of grasses, 4-470.

Sheath-bill. A white wading bird of Antarctica, with horny sheath over nostrils.

She'ba, Queen of. Queen of great beauty, mentioned in Bible (1 Kings. x); frequently regarded as ruler of Sabaeans in S. Arabia; and Solomon, 7-84.

Shechem [shé'kem]. Anc. city of Palestine, 80 m. N. of Jerusalem, connected with traditions of Abraham, Jacob, and later Hebrew history; modern Nablus.

Shoe, Sir Martin Archer (1769-1850). Brit. portrait painter, P.R.A. 1830-50; also painted many subject pictures; portrait of William IV, 7-469 illus.

Sheep, 7-20; in Australia, 1-319, 320. Bakewell's work on breeding, 1-78 dipping sheep, 6-78 illus.; eve, 3-333 illus.; composition of horns, 4-191; effect of metallic salts on growth, 5-178 illus.; milk from, 5-205; in New Zealand, 5-423 illus.; shearing, 1-313, 7-22; in Spain, 7-103; in Uruguay, 7-371 illus.; wool, 7-473, 474, 475.

Sheep Dogs, 3-101, 103 illus.; Old English sheep dog, 3-101 illus. f.

Sheepshank, knot, 4-422 illus.

Sheerness. Port and naval base in Kent on Isle of Sheppey at confluence of Thames and Medway; pop. 15,727.

Sheet-bend Knot. See *Weaver's Knot*.

Sheet glass, how made, 4-31.

Sheets. See *Nautical Terms* (list).

Sheffield. Steel mfg. city of Yorks, Eng.; on r. Don; pop. 512,831; 7-23, 3-249.

Sheffield, H.M.S. Brit. cruiser, 5-347.

Sheffield steel, 4-295.

Sheffield University, 7-23.

Shekel. Anc. unit of weight and coin of same weight, used by Babylonians, Phoenicians, and Jews. See *Weights and Measures*.

Sheld-duck, 3-131, 132 illus., 1-408 illus.

Sheldon, Gilbert (1598-1677). Eng. prelate; Bishop of London (1660) and Archbishop of Canterbury (1663); chancellor of Oxford University, where he built and endowed the Sheldonian Theatre, 6-20.

Shelf ice, in Antarctica, 1-164.

Shell. In artillery, 1-258, 260; anti-aircraft, 1-171, 173.

Shell of marine animals, 7-24 with illus. f.; buttons from sea-shells, 1-146; of snail, 7-73.

Shellac. Substance secreted by the lac insects, 4-434, 6-389.

Shelley, Percy Bysshe (1792-1822). Brit. poet, 7-24; poem, 7-25; 3-289.

Shellfish. See *Molluscs*.

Shem. One of Noah's sons in the Biblical story; traditional ancestor of Semitic peoples; 5-445.

Shenandoah (shenandoh). R. of Virginia and W. Virginia, U.S.A., tributary of Potomac, 200 m. long.

Shenandoah Valley, Virginia, U.S.A. Picturesque valley between Blue Ridge and Allegheny Mts.; scene of fighting in Amer. Civil War.

Shensi. Prov. in S. China; area 72,000 sq. m.; pop. 9,398,000; fertile plateau in S.; cent. plain drained by Wei r.; mts. in s.

Shepherd Kings. See *Hyksos*.

Shepherd's Purse. A weed, 7-26.

Sheppard, Hugh Richard Lawrie ("Dick") (1880-1937). Brit. divine, vicar of St. Martin-in-the-Fields, London (1914-27); later dean of Canterbury and canon and precentor of St. Paul's cathedral; a prominent pacifist, he founded the Peace Pledge Union in 1931.

Sheppard, "Jack" (1702-24). Eng. highwayman; in 1724 Jonathan Wild gave him up to justice; after twice escaping from Newgate, was hanged at Tyburn.

Sherardising. Process of coating non-ferrous metal with the metal, which is surrounded by zinc powder, to a temperature just below the melting point of zinc. This gives the metal a rust-resistant film, 6-481, 7-523.

Sherraton, Thomas (1751-1806). After Chippendale, most famous Brit. furniture designer, 3-191, 193 illus.

Sherborne. Tn. of Dorset, magnificent church once belonging to an abbey; pop. 6,000; Sherborne School, a boys' public school, dates from 1550.

Sherbrooke, Canada. Port and city at confluence of Magog and St. Francis rivers, in Quebec; pop. 50,543; paper, asbestos, lumber, wool, machinery, textiles.

Sheridan, Richard Brinsley Butler (1751-1816). Brit. wit, dramatist, and politician, 7-26, 3-121, 3-258.

Sheriff. In Eng., public official in a county and in certain cities and boroughs, whose duties include the execution of writs, preparing panels of jurors for assizes, etc.; the two sheriffs of the City of London are elected annually by freemen who are liverymen of the City companies, in U.S.A., county officer with certain judicial and police functions.

Sheriffmuir, Battle of. Indecisive battle fought between Jacobites and Royalists, in 1715.

Sheringham. Tn. and seaside resort in Norfolk, Eng.; lobster fisheries; pop. 4,803; 5-448.

Sherman, William Tecumseh (1820-91). Amer. general; joined the North in Civil War; distinguished himself at Bull Run and Shiloh; with Grant at Vicksburg and Chattanooga; famous "march to the sea" from Atlanta to Savannah, 4-512.

Sherpas. Tribe of Nepal who live on slopes of Himalayas; porters with Everest expeditions, 3-321.

Sherriff, Robert Cedric (b. 1896). Brit. dramatist (*Journeys End*, *Miss Mabel*, *Home at Seven*) and novelist (*The Forthright in September*, *Another Year*).

Sherrington, Sir Charles Scott (1857-1952). Brit. neurologist; portrait, 5-164.

Sherry, wine (named from Jerez in Spain); brandy in, 1-96.

Sherwood, Robert Emmet (b. 1896). American playwright (*The Road to Rome*, *Reunion in Vienna*, *Idiot Delight*); 7-366.

Sherwood Forest. Holly dist. in Nottinghamshire; former royal hunting preserve; legendary retreat of Robin Hood, 6-416, 6-468.

Sheshonk or Shishak I (10th cen. B.C.). Egyptian king of 22nd dynasty, invaded Palestine and plundered Solomon's Temple; monument at Karnak.

SHETLAND ISLES

Shetland Isles. Group of *isles* 120 m. N.E. of Scotland and 200 m. W. of Norway; area 550 sq. m.; pop. 19,343; cap. Lerwick, 7-27.

Shetland Pony. Smallest Brit. species of horse, 7-27.

Shia Muslims. Mahomedan sect, 5-89, 6-131.

Shibam. City in Hadramaut, Arabia: skyscrapers, 1-192 illus.

Shiba Temple. Japan, 4-314 illus.

Shiel, Loch. Sea loch, Inverness-shire, Scot. Length 18 m., width 1 m., 4-275.

Shield. In armour, 1-243.

Shield. In heraldry, 4-164 illus. f.; devices used in, 4-165.

Shi-Hwang-ti [shéwoungtí] (259-210 B.C.). "First emperor" of China: king of T'ain who overthrew feudal system and established centralised govt. over all China; to break opposition to reforms, ordered burning of all historical books.

Shijo. School of Jap. art, founded by Okyo (1733-95), 4-353.

Shikoku. One of the *isles* of Japan, 4-340; map, 4-341.

Shillbeer, George (1897-1866). Brit. coach-builder; and first omnibus, 6-112.

Shilling. A Brit. coin worth 12 pence, 5-233 illus. f.; Irish coin, 4-285 illus.

Shillong. Cap. of Assam, Rep. of India; pop. 21,300, 1-276, 4-241.

Shiloh [shil'oh]. Anc. tn. 20 m. N. of Jerusalem; contained sanctuary of ark of the covenant.

Shimonoseki. Japan. Fortified port on s.w. end of Honshu; pop. 133,000; rly. terminus and shipping point; bombarded by foreign vessels (1861); treaty ending Sino-Japanese War (1895) concluded there.

Shin, Loch. Lake in Sutherland, Scot., about 161 m. long and 1 m. broad.

Shinar. Plain of. Hebrew name for Babylonia; city states in, 1-336.

Shintoism. Religion of Japan, 4-344, 348 illus.

Shinty. Scottish game resembling hockey, 4-211, 4-181.

Ship. See *Ships and Shipbuilding*.

Ship'ka Pass. Bulgaria. Pass through Balkan Mts. N.E. of Plovdiv; forced by Russians in Russo-Turkish War (1877-78).

Ship-money. Old Eng. tax imposed on maritime counties to pay for ships in time of war; attempt of Charles I. to levy it upon all England as regular tax was a contributory cause of Civil War; John Hampden and, 4-123.

Ships and Shipbuilding. 7-28, 7-33-40 illus.; A.I. as a shipping term, 1-1; alloys in, 1-115; barnacles, 1-369; ball-time aboard and watches, 7-279; distinguished from boat, 1-497; cable-ships, 2-155; careers in, 2-238, 240; at Clydebank, 4-29, 2-425 illus.; compass, 2-474; calculation of displacement, 1-208; dredgers, 3-125; friction between ship and water, 3-170; gyroscopes as stabilisers, 4-114; magnetic field and mines, 5-220 diag., 5-81; Merchant Navy, 5-171; navigation, 5-338; Navy, 5-342; of oak, 5-489; use of radar, 6-339; radio installed in, 6-343; sailing vessels, 7-28, 29, 33 illus.; rats in, 6-365; ship's log, 5-14; turbine engines, 7-330, 331; Viking ships, 7-400 illus.; in 2nd World War, 1-293, 294, 295. See also *Boats and Canoes*; *Navigation*; *Navy*; *Submarine*; *Yachts*.

Ship's Biscuit. 2-32.

Ship's Log. Device for measuring a ship's speed; also official day-to-day ship's diary, 5-14.

Ship's News Service. estab. by Marconi, 5-123.

Ship's Siren. 7-87.

Shipton, Eric (b. 1907). Brit. mountaineer; Everest expeditions, 3-321.

Shipton, Mother (1488-1561). Eng. prophetess or witch, lived near Droppin Well, Knarborough, Yorks, where her cave is still to be seen; her maiden name was Ursula Southall; she is said to have prophesied the

Fire of London, and the deaths of Cromwell, Wolsey, and others; she also foretold the invention of the steam-engine and the electric telegraph.

Shipworm. A marine bivalve mollusc, 7-323, 7-500.

Shiraz. City in Persia; pop. 114,000; 6-132.

Shire. Administrative division in Gt. Brit., usually corresponding to the county but sometimes small districts, such as Northants in Northumberland.

Shire [shé'rā]. R. of Brit. E. Africa, from end of Lake Nyasa, s. 370 m. to Zambezi; only tributary of Zambezi navigable from sea.

Shire horse. 4-197.

Shirley, James (1596-1666). English dramatist, link between Elizabethan and Restoration periods; wrote about 40 plays (*The Traitor*; *Hyde Park*).

Shishak (Kg. king). See *Sheshonk*.

Shiva's Temple. plateau in Arizona, U.S.A.; first climbed in 1937, 1-238.

Shkodër or Scutari. Tn. of Albania, on Lake Scutari; pop. 29,200; fell to Montenegrins after siege in Balkan Wars; taken by Austrians in 1st World War; 1-91 illus.

Shock. first aid for, 3-368.

Shock-Headed Peter (Struwwelpeter). Nonsense verses by H. Hoffmann, 2-356.

Shoebill. An African stork, 7-106, 169 illus.

Shoes. health and well-fitting shoes, 4-224, 3-114; sole leather, 4-167; upper leathers, 4-408, 469. See also *Boots and Shoes*.

Shofar. The ram's horn blown on Friday evening before the Jewish sabbath, 4-375 illus.

Shogun [shō'gun]. Former commander-in-chief of Japanese armies and virtual ruler; deposed by Emperor (1868), 4-310, 341.

Sholapur. Tn. in Bombay state, India; pop. 213,000; 1-517.

Sholokhov, Michel (b. 1905). Russian novelist, 6-181.

Shooting. 7-42.

Shooting Season for game; grouse, 4-99; partridge, 6-94; pheasant, 6-153.

Shooting stars. See *Meteors*.

Shops. co-operative societies, 2-499; careers in retailing, 2-210.

Shore, Jane (d. c. 1527). Favourite of Edward IV of Eng.; accused by Richard III of witchcraft; imprisoned; died in want.

Shore-ditch. Bor. of N.E. London; chit industries, furniture and boot and shoe making; pop. 44,880; 5-27.

Shore-lark. Bird, 4-447.

Short, Hugh Oswald. Brit. aircraft designer, one of three brothers. Began by building balloons, and later (1908) aeroplanes. Short Bros. (founded at Rochester, now at Belfast), is oldest est. aircraft concern in Gt. Britain, famous for marine aircraft.

Short Circuit. An electrical condition created when the terminals of a generator, cell, or battery, or other source or conveyor of electrical energy are accidentally connected by a conducting path of low resistance. The current then strays from its intended course 3-213.

Short-eared owl. type of owl, 6-12.

Shorthand. 7-42. Peppy's diary in, 6-121; careers as professional writer, 2-240.

Shorthorn cattle. 1-78, 2-274, 275 illus.

Short Parliament. in Eng. history, Parliament sitting from April 13 to May 5, 1640; followed by Long Parliament in November.

Short S.A. 4/2. Delta bomber, 1-44.

Short selling. See *Stock Exchange Terms*.

Short Sight. and shape of eyeball, 3-332 with diag.

Short Ton. See *Weights and Measures*.

Short waves. in radio, 6-313.

Shoshone Falls [shōshō'nē]. Cataract on Snake r., s. Idaho, U.S.A.; 190 ft.

Shoshone River. See *Snake River*.

Shostakovich, Dmitri (b. 1906). Russ.

SIBELIUS

composer; wrote several symphonies. Attacked in 1918 by central committee of communist party of U.S.S.R. for "anti-democratic tendencies" in his music. Publicly admitted the charge, and repented; 5-306.

Shoulder. Name given to part of a hide, 4-467 with diag.

Shoulder blade (scapula), in skeleton, 7-60, 1-141.

Shoulder girdle. in skeleton, 7-60.

Shovell, Sir Cloudesley (1650-1707). Eng. admiral; led attack on shipping in harbour of Tripoli in 1675, and distinguished himself at battle of Bantrey Bay in 1689, in 1705 he brought about the reduction of Barcelona, and on the journey home his ship was lost with all hands on board; 6-509.

Shrew-jumping. for horses; in Britain, 6-101, 4-197.

Shrapnel. and personal armour, 1-211.

Shrew. Small mammal resembling a mouse but with a long pointed muzzle, actually member of group *Insectivora*; three species are found in Gt. Brit.; one of them, the pygmy shrew, is smallest Brit. mammal. Others are the common shrew often picked up dead by the roadside, and the water shrew.

Shrewsbury, John Talbot, 1st Earl of (1388-1453). Eng. soldier; after service in Ireland he took part in the French Wars; he was checked by Joan of Arc at Orleans and taken prisoner in 1429 at Patay; his last fight was in Castillon in 1453, where he was killed.

Shrewsbury [shróz'beri]. Old city, co. tn. of Shropshire, on r. Severn; pop. 14,926; school founded by Edward VI; 7-44, 7-4; battle of Shrewsbury (1463), 4-162.

Shrike, or Butcher bird. 7-43.

Shrimp. A small crustacean, 7-44, 4-95.

Shropshire (or Salop). Co. of Eng., area 1,347 sq. m.; pop. 289,811; co. tn. Shrewsbury, 7-44.

Shropshire sheep. 7-22.

Shroud-laid rope. 6-152.

Shrouds. See *Nautical Terms* (list).

Shrove Tuesday, or Mardi Gras. the day preceding Ash Wednesday, first day of Lent.

Shunt connexion. in electric motor, 5-275.

Shutter. of camera, 6-171 illus.

Shuttle. Part of loom; in weaving, 7-434, 2-256, 6-37.

Shuttlecock. Weighted cork, with feathers projecting in a ring from one end, kept in the air as long as possible in the old game of battledore and shuttlecock, and hit over a net by a racket in badminton.

Shwe Dagon Pagoda. Rangoon, Burma; Buddhist shrine, 6-363 with illus.

Shylock. In Shakespeare's *Merchant of Venice*, avaricious Jewish money-lender, 5-173.

Siam. Kingdom of S.E. Asia; area 193,270 sq. m.; pop. 17,517,742; cap. Bangkok; 7-45; flag, 3-385 illus. f.; people, 7-46; and Gregorian calendar, 2-175; transport in, 7-15 illus. f.; temple dances, 7-46 illus.; King of the Devils, 7-11 illus. f.; in 2nd World War, 7-191.

Siam, Gulf of. Arm of Pacific Ocean partly enclosed by Indo-China and the Malay Peninsula.

Siamang. Type of gibbon, 4-18.

Siamese Cat. 2-263, 262 illus.

Siamese Twins. Twins joined together at birth; applied esp. to Eng and Chang (1811-74) twins born in Siam of Chinese father and Siamese mother; joined together at breast-bones by cartilaginous band, 7-47.

Sianfu [sianfō]. Singanfu, or Singanfu, China. Walled city on r. Wei 400 m. N.W. of Hangkow; pop. 760,000; famous Nestorian tablet; important trade centre for cent. Asia.

Siauliai. Tn. in Lithuania; pop. 31,000; 4-524.

Sibelius, Jean Julius Christian (b. 1865). Finnish composer, 7-47, 5-306.

SIBERIA

Siberia. Huge northern Asiatic territory of 4,831,883 sq. m., part of the R.S.F.S.R.; chief ts. Novosibirsk, Omsk, Irkutsk, Vladivostok, 7-48 c. Russ. settlements in Arctic, 1-222; Siberian forest, 1-268.

Sibiu [sə'bɪu], Rumania. Industrial tn., 132 m. n.w. of Bucharest; 12th cent. Saxon settlement; pop. 63,700.

Sibyls. In Gk. and Rom. legend, prophetic seers inspired by Apollo.

Sicilian Vespers. Name given to a massacre of their Fr. oppressors by the Sicilians on Easter Monday 1282, 7-50, 4-313.

Sicily. Largest isl. in Mediterranean; part of Italy; area 9,925 sq. m.; pop. 4,452,773; cap. Palermo, 7-49, 4-304; map, 4-305; in 2nd World War, 7-494, 485 illus.

Sickert, Walter Richard (1860-1942). Brit. painter; and impressionism, 4-237, 2-263.

Sickle fish. Tropical fish, 5-128 illus. f.

Sid'ons, Sarah (1755-1831). Brit. tragic actress, greatest of the Kemble family and school; unequalled "Lady Macbeth"; painted by Reynolds as "The Tragic Muse."

Side-drum. Type of drum, 3-129, 128 illus.

Sideral time. 7-279; length of day, 3-55.

Siderite. A carbonate; iron-ore in, 4-288.

Side stroke, in swimming. 7-208, 209.

Sidgwick, Henry (1838-1900). Brit. philosopher; from 1883 professor of moral philosophy at Cambridge univ.; *Methods of Ethics* (1874).

Sidi Barrani. Vill. of Egypt, on Mediterranean, 60 m. n. of Bardia; taken by Graziani's It. forces Sept. 1940, and recaptured by Brit. and Free Fr. forces Dec. 11; in June 1942 taken by Rommel's It. and Ger. troops, and recaptured after Alamain victory by Brit. on Nov. 10; 7-489.

Sidi-bel-Abbes, Algeria. h.q. of Fr. Foreign Legion, 1-110.

Sidlaw Hills. Scot. Range of hills forming the s. boundary of Strathmore and extending N.E. from Kinnoull Hill in Perthshire to Stonehaven in Kincardineshire, highest point, 1,493 ft.; 6-510.

Sidney, Sir Philip (1554-86). Eng. poet, courtier, diplomatist, and soldier, 7-51, 3-234.

Sidney Sussex College, Cambridge Univ. 2-182; arms, 4-165 illus. f.

Sidon [sɪ'dɒn]. Anc. Phoenician city on Mediterranean (modern Saida), 25 m. s. of Beirut; noted for glass; commerce; 6-161, 4-473.

Sidonians. Name given to the Phoenicians in the Bible, 6-161.

Siebs, Augustus (1788-1872). Anglo-German inventor, and rubber diving suit, 3-94.

Sieg. Tributary of r. Rhine, length 80 m., enters Rhine 2 m. n. of Bonn, 6-390.

Siege. See Sieges (list).

Siegfried. Hero in German poem *The Song of the Nibelungs*, 5-429.

Siegfried. Opera by Richard Wagner; story, 5-520.

Siegfried Line. Ger. 2nd World War fortifications along w. frontier, facing Maginot line of France; breached by Allies in 1944; 7-499 illus.

Siemens [sɪ'menz], Ernst Werner von (1816-92). Ger. inventor; suggested use of gutta-percha in insulating underground and marine cables; inventor of many electrical improvements and pneumatic tube system.

Siemens, Sir William (1823-83). Brit. inventor (b. Ger.), younger brother of preceding; with Werner von Siemens invented Siemens armature; with August Friedrich, another brother, invented Siemens regenerative furnace; 3-490, 4-294.

Siena [sɪən'a] or **Sienna.** It. mfg. and trade city 30 m. s. of Florence; pop. 48,000; famous Gothic cath.; Siennese school of art, 4-317.

Siemkiewicz [shenkyá'včh], Henryk (1846-1916). Polish novelist, 1905 Nobel prizewinner for literature (*Quo Vadis?* most famous novel, tale of Rome under Nero).

Sienna. Earth used as pigment; brownish-yellow if raw, and reddish-brown if burnt. The name is derived from the town of Siena, where it was produced.

Sierra, Gregorio Martinez. See Martinez Sierra.

Sierra de Gata [sɪə'rə dā gah'tah]. Chain of mts. in Sp. and Port. separating the valleys of the rivers Tago and Douro; 5,690 ft.

Sierra de Gredos. Mt. range of cent Sp.; 8,730 ft.

Sierra de Guadarrama. Mt. range of cent. Sp. separating Old and New Castile; 7,900 ft.

Sierra Leone [sɪə'rə lɪə'nə]. Brit. colony and protectorate on w. coast of Africa; colony, 2,500 sq. m.; pop. 121,000; chief tn., Freetown; protectorate, inland, 27,925 sq. m.; pop. 2,005,000; exports ginger, palm nuts and oil, kola nuts; 7-440; village, 1-55 illus.

Sierra Madre, Mexico. Name of two mt. ranges forming the eastern and the western walls of the great cent. plateau, 5-186, 5-462.

Sierra Morena. Low mt. range of S. Sp.; rises slightly above Iberian plateau to n. and drops sharply on S. to valley of the Guadalquivir.

Sierra Nevada ("Snowy Range"). Highest mt. range in Sp.; extends about 60 m. E. and W. through Andalusia and Granada near Mediterranean coast; highest peak, Mulhacén, 11,420 ft.; vineyard and orchards on S. slopes.

Sierra Nevada. Mt. range in N. Amer.; highest peak Mt. Whitney (14,500 ft.), 5-452, 453, 2-177.

Sierra Nevada de Merida. A branch of the Andes, extends N.E. from Colombia into Venezuela and continues as the Maritime Andes or Caribbean Hills, 7-384.

Sight Crag. Highest point in Cumberland, Eng., 1,702 ft., 3-9.

Sigismund [sɪ'gɪsmʌnd] (1368-1387). Holy Rom. emperor, succeeded in 1410; caused convocation of Council of Constance, which ended the Great Schism in 1417; 4-188.

Sigma, σ, ς (used at end of words: Σ (Rom. s, S). 18th letter of Greek alphabet.

Signac, Paul (1863-1935). Fr. painter and impressionist technique, 4-237.

Signalling. 7-51; on railways, 6-334 (telegraphy, 7-237, 238, 239; colour used in, 2-461; 7-52, illus. f.

Signatura, Apostolic. Supreme tribunal of Rom. Cath. Church.

Signature. on sections of a book, methods of marking, 2-6, 8 diag.

Sigurd [sɪ'gʊrd]. Norse hero who plays in the Volunga Saga the part taken by Siegfried in *The Song of the Nibelungs*.

Sika [sɪ'ka]. Japanese species of deer 3-60.

SOME OF THE WORLD'S MOST FAMOUS SIEGES

Name	Date	Duration	
Troy	12th or 13th cent. (?) B.C.	10 years	Trojans besieged by Greeks. Fell.
Syracuse	214-212 B.C.	2 years	Greeks besieged by Romans under Marcellus. Fell.
Carthage	148-146 B.C.	2 years	Carthaginians besieged by Romans. Fell.
Jerusalem	637	4 months	Mahomedans led by Omar invested Byzantine forces. Fell.
Constantinople	673-677	5 years	Byzantines besieged by Saracens. Raised.
	717-18	1 year	Same as above.
Officinas	1428-29	10 months	French besieged by English. Relieved by Joan of Arc
Constantinople	1453	54 days	Byzantines besieged by Turks. Fell.
Leiden	1573-74	12 months	Spaniards besieged Dutch. Raised after Dutch cut dykes
Antwerp	1584-85	14 months	Dutch besieged by Spaniards under Duke of Parma. Fell.
Ostend	1601-04	3 years	Dutch besieged by Spaniards. Surrendered.
La Rochelle	1627	1 year	French Huguenots besieged by Fr. Roman Catholics under Richelieu. Fell.
Candia	1467-69	2 years	Venetians besieged by Turks. Fell.
Acre	1751	50 days	120 British and 200 Sepoys under Clive besieged by 150 French and 10,000 Sepoys. Raised.
Gibraltar	1779-83	3 yrs. 7 mths. 12 dys.	British besieged by Spaniards. Raised.
Novostepol	1856	335 days	Russians besieged by Allies. Fell.
Delhi	1857	131 days	Indian mutineers besieged by British. Fell.
Lucknow	1857	149 days	British besieged by Indian mutineers. Raised.
Vicksburg	1862-63	186 days	Confederates besieged by Federals under Grant. Fell.
Richmond, U.S.A.	1864-65	287 days	Confederates besieged by Federals. Evacuated
Paris	1870-71	135 days	French besieged by Germans. Surrendered.
Plevna	1877	144 days	Turks besieged by Russians and Rumanians. Surrendered
Lady Smith	1899-1900	118 days	British besieged by Boers. Raised.
Mafeking	1899-1900	217 days	British under Baden-Powell besieged by Boers. Raised.
Port Arthur	1905	241 days	Russians besieged by Japanese. Surrendered.
Adrianople	1912-13	155 days	Turks besieged by Bulgarians. Fell.
Kut-ul-Amara	1915-16	140 days	British besieged by Turks. Fell.
Verdun	1916	10 months	French besieged by Germans. Raised.
Leningrad	1941-44	29 months	Russians besieged by Germans. Raised.
Sevastopol	1941-42	8 months	Russians besieged by Germans. Evacuated.
Tobruk	1941	200 days	British besieged by Germans and Italians. Raised.
Stalingrad	1942-43	6 months	Russians besieged by Germans. Raised, and German 6th Army destroyed.

Sikhs. Religious community of the Punjab, India some 3,000,000 in all, 4-241; dressing of beards, 1-397.

Sikh Wars (1846-46 and 1848-49). Indian campaign between Brit. and Sikhs; the death in 1839 of Ranjit Singh was followed by anarchy, and Brit. territory was invaded; the Sikhs were defeated at Mudki, Alwal, and Sobroon; in 1846 Brit. annexed the dist. between the Sutlej and Beas; after the capture of Multan in 1848, the Punjab was annexed in 1849; 6-310.

si-kiang ("West River"). Largest stream in s.w. China; 1,250 m. long; enters China Sea through delta near Canton, 2-361.

Sikkim. State under protection of the Rep. of India; adjoins Nepal; area 2,745 sq. m.; pop. 135,616; 4-241.

Sikorski, Wladyslaw (1881-1943). Pol. soldier and statesman; served in 1st World War and Pol.-Russ. war of 1919-20; in 1922 premier; gathered army of exiled Poles in Fr. when Ger. attacked Poland; prime min. and c.-in-c. in exiled govt.; short-lived treaty with Russia, 1911; killed in air accident, 1943.

Sikorsky, Igor (b. 1889). Russ.-Amer. aircraft designer of the first multi-engine plane (1913); helicopter, 4-158.

Silchester. Vill. in Hants, site of the Roman tn. of Calleva Atrebatum. Excavations from 1890 onwards have revealed many remains, including the foundations of a church, probably 14th cent., described as the first Christian church in Britain.

Silesia [sil'esh'ya]. Region in cont. Europe; taken by Prussia from Austria in 1740-45; in 1914 area was 18,000 sq. m., pop. 6,000,000. After 1st World War, Germany retained Lower Silesia (10,270 sq. m.; pop. 2,000,000), Czechoslovakia received 1,707 sq. m. (pop. 738,000), which became the Czech prov. of Slezsko, and Poland received Upper Silesia (1,630 sq. m.; pop. 1,315,000) after a League of Nations plebiscite in 1921. After 2nd World War all of German Silesia E. of Oder went to Poland, the Ger. pop. being expelled. Ger. pop. of Slezsko also expelled. Coal, iron, chemicals, glass, textiles; 5-125, 7-2, 3-21.

Silica or Silicon dioxide (SiO₂). occurs in Nature as sand, flint, rock or crystal, quartz, etc.; 7-53, 6-320; silica gel, 2-155; in cement mfr. 2-288.

Silicates, salts of silicic acid.

Silicic acids. Weak polybasic acids of the formulae H₂SiO₃ and H₄SiO₄; silicic acid gels which are capable of absorbing large quantities of water are obtained by treating waterglass with hydrochloric acid.

Silicon (Si). Non-metallic element of the carbon group; atomic no. 14; atomic weight 28.06; melts at 1,450° C.; second most abundant element in earth's crust, 7-53, 3-224; in alloys, 1-114, 116; sand, 6-196.

Silicon carbide (SiC), or carborundum, as an abrasive, 7-53.

Silicones, lubricating and waterproofing compounds of silicon, 7-53.

Silistra or Silistria. Town on Danube in N.E. Bulgaria, ceded by Rumania in 1940; pop. 17,000; Rom. Durostorum; former fortress, frequently besieged.

Silk, 7-53; compared with cellulose rayon, 6-369.

Silk moth (*Bombyx mori*); and silk production, 7-53.

Silkworm, 7-53, 2-136; and mulberry trees, 5-290; feeding silkworms, 1-272 illus.; industry in Japan, 4-342.

Sill. See **Architectural Terms**.

Silo [sil'lo]. Chamber or pit for preserving green fodder by excluding air and water. See **Silage**. Also, a tall cylindrical structure, usually of reinforced concrete used for storage of grain.

Siloam [sil'lam]. Pool in Jerusalem, part of anc. water supply; fed from

"Fountain of the Virgin"; on the wall of the reservoir is oldest known Hebrew inscription.

Silurian Period. In geology, 3-515, 518.

Silver (Ag). Precious metallic element of the copper group; atomic no. 47; atomic weight 107.880; melts at 960.5° C.; 7-56, 3-224; alloys, 1-114; in electroplating, 3-225; in Mexico, 5-187; as money, 5-223, 5-235; Persian silversmith, 6-131; Rom. silverware, 6-139 illus.; in sea-water, 5-190.

Silver Birch (*Betula pendula*). Deciduous tree, 1-452 illus., 7-314 illus.

Silver bromide, on photographic film, 6-181.

Silver Fir, tree, 3-355 with illus.

Silverfish (*Leptisa saccharina*); damage to books, 2-12.

Silver Grey Dorking. Breed of poultry, 6-277 illus. f.

Silver-laced Wyandotte. Breed of poultry, 6-277 illus. f.

Silver nitrate. Compound of silver used in medicine and industrial chemistry, 7-56; as backing for mirrors, 6-225.

Silver renny. Coin circulated in Eng. after Norman Conquest, 5-235.

Silver pheasant. Bird 6-153.

Silver sand, 6-196.

Silver-spotted Hairstreak butterfly, 2-111 illus.

Silver-studded Blue butterfly, 2-140 illus.

Silver sulphide. Combination of silver and sulphur; stains cutlery, 7-56.

Silver-washed Fritillary butterfly, 2-138 illus.

Silver Wattle. See **Mimosa**.

Silver Y moth. Commonest of Brit. moths, often seen on wing in daytime. Distinguished by Y-shaped markings on forewings.

Silverstee II (type). See **Silverstee**.

Sim'coe, John Graves (1752-1806). Brit. soldier and 1st Lieut.-gov. of Upper Canada (1792-96); memorial to, 7-291 illus.

Simcoe Lake, Canada, 30 m. long 18 m. wide; 160 sq. m.; empties into Lake Huron through Georgian Bay.

Simenon, Georges (b. 1903). Belgian novelist; wrote many stories, inventing a French detective called Maigret.

Sim'oon. Second son of Jacob; traditional ancestor of tribe of Simoon.

Sim'oon Stylites, St. [stil'tez] (4th-5th cent.) Syrian monk, first and most famous of the "Pillar Saints," who lived on high pillars, 1-176.

Simferopol [sim'feropol]. In. in s.w. Crimea, Ukraine S.S.R.; pop. 143,000; famous for fruit; 2-532.

Simiidae. The ape family, 1-180.

Simile [sim'ill]. Figure of speech, 3-351.

Simla. Cap. of the Himachal Union, Rep. of India, 7,000 ft. up in Himalayas, 4-211.

Sim'oon, John Alsebrook Simon, 1st Viscount (1873-1951). Brit. lawyer and statesman; solicitor-gen. 1910; home sec., 1915-16; leader of "Asquithian" Liberals 1922-31, chairman of royal comms. on home rule for India (Simon report, 1930); home sec. in nat. govt. 1931, for. sec. 1931-35, chancellor of exchequer 1937-40, leader of "Nat.-Lib." party; vicer. 1910; lord chancellor 1940-45.

Simonides [sim'oni-des] (c. 556-168 B.C.). Gk. lyric poet, a finished craftsman, but not a great imaginative poet; celebrated the heroes of his own day in a great variety of metrical structure.

Simon Magus. Samaritan sorcerer, converted to Christianity, who offered Peter and John money for the power of the Holy Ghost (Acts viii).

Simonov, Konstantin (b. 1918). Russ. playwright, 6-181.

Simon Peter (apostle). See **Peter, St.**

Simon's Town. Naval spt. of S. Africa, harbour berths the largest warships; 22 m. s.e. of Cape Town.

Simony [sim'oni]. Purchase of spiritual benefit or Church preferment.

Simon Zelotes. One of the 12 apostles, 1-181.

Simple leaf. In botany, a leaf with a single blade, 4-471.

Simple Tunnel, 7-215.

Simpsom, George Gaylord (b. 1902). American zoologist, curator of fossil mammals and birds in the Amer. Mus. of Nat. Hist., N.Y.C.; led expedns. in N. and S. Amer. to collect fossil animals; compiler of a classification of mammals now widely adopted.

Simpsom, Sir James Young (1811-70). Brit. physician; aroused historic storm of religious and medical censure by using anaesthetic in childbirth; discovered chloroform, 1-143, 5-165, 7-195; portrait, 5-163.

Synonymous Equation. In algebra, 1-108.

Sinai [sina'i] or **Horeb**, Mt. Biblical locality often identified with group of peaks in Sinai peninsula at head of Red Sea; Semitic alphabet discovered, 1-120; copper mines, 2-502; stinging sands, 6-190.

Sinaloa [sina'loa]. Mexico. State in N.W. on Pacific; area 22,580 sq. m.; pop. 560,000; cap. Culiacan; mining and agriculture.

Sinclair, Upton (Beall) (b. 1878). Amer. novelist and social reformer; *The Jungle* led Pres. T. Roosevelt to order investigation of meat-packing industry; wrote numerous novels and books on social and economic problems (*King Coal*, a novel of the Colorado strike; *The Profits of Religion*; *The Brass Check*, an exposure of Amer. journalism); and long progressive series of sociological novels depicting contemporary events, with same central character; awarded Pulitzer Prize 1913; 7-366.

Sind. Prov. of Pakistan, bounded N. by Punjab; E. and S. by India, s.w. by Arabian Sea; w. by Baluchistan; area (excluding Khazpur) 18,136 sq. m.; pop. 6,037,000; cap. is Karachi. Mainly a plain watered by Indus r.; agriculture is dependent on irrigation; 4-252, 259; 6-11.

Sinding, Christian (1856-1941). Norwegian composer; works strongly Norwegian in spirit (*Frukingen*, *Marche Grotte*).

Singapore. Brit. isl. and city, Malay Peninsula; commercial centre and naval base; area of isl. 225 sq. m.; pop. 1,042,000; 7-56, 57 illus., 5-91; in 2nd World War, 7-191.

Singapore Colony. Brit. colony formed in 1845 out of former Straits Settlements, Singapore, Cocos-Keeling Isl. and Christmas Isl.; area 290 sq. m.; 5-91, 7-57.

Singer, Isaac Merritt (1811-75). Amer. inventor of sewing machine, 7-10.

Singidunum (Rom. fortress). See **Belgrade**.

Singing, 7-57; development of choral singing, 5-302; folk songs, 3-406.

Singles, in lawn tennis, 4-160.

Sinhalese. People of Ceylon who originally came from N. India, 2-297.

Sinagalia [sin'agal'ya] or **Sengalia**. In. port on Adriatic N. of Ancona; pop. 12,000; anc. Rom. Sena Gallia.

Sinkiang [sinkiang]. Prov. of w. China, including Chinese Turkestan; area 705,000 sq. m.; pop. 1,560,000; cap. Tihua; dry region, but fruit, cereals, and cotton raised by irrigation; 7-331.

Sinn Fín [shin'fán]. Irish revolutionary party, 4-283; in Cork, 2-505.

Sinon. Friend of Odysseus, 7-380.

Sinope [sinop'el], or **Sinop.** Port of Turkey; best harbour on N. shore of Black Sea; pop. 32,000; anc. Gk. colony; Russians destroyed Turk. fleet (1853); exports timber, dried fruits, skins, and silks.

Sinus. In physiology, any hollow in an animal organ or anatomical structure; particularly air-filled hollows in head bones which communicate with the nose.

Sion [zi'on] College. London Institution founded in 1823 under the will of Thomas White, vicar of St. Dunstan's in the West, as a college, parochial clergy guild, and almshouse; now only a college and guild; fine theological library; moved from London Wall to Victoria Embankment (1886).

Siouan [sio'an] Indians. One of the largest and most widely extended linguistic stocks of N. Amer. Indians, occupying chiefly the great plains area; often called the Plains Indians.

Siouan Tribe of American Indians of Siouan stock, 6 371; chieftain, 3-372 illus. f.; war with Americans (1871-77), 5-380.

Sioux City, Iowa, U.S.A. Mfg. and commercial city on w. border of Missouri and Big Sioux river; pop. 83,990; packed meat, flour, sashes and doors, brick and tile.

Siphon. In hydraulics, 7 58.

Siphonaptera, or **Aphaniptera**. The flea order of insects, 4-270.

Siphonophora. Order of primitive animal forms including jelly fish; Portuguese Man-of-War, 4 360.

"**Siphons**" of soda water, not true siphons, 7 58.

Siren. Device for generating sound 7-87 with illus.

Sirenia. Order of aquatic mammals with flippers, 5 103.

Sirens. Sea nymphs in the story of the *Odyssey*, 5-501.

Sirex. Generic name of species of wood-wasp, or horntail, members of saw-fly group, of insect order *Hymenoptera*; principal is *S. gigas*, giant horntail, large, bright, orange and bluish creature, whose grub does much damage in pine and larch woods; it is attacked by ichneumon fly, *Ichneumon*.

Sir Gawain and the Green Knight. Arthurian legend, 8-457.

Sirhan Valley, Arabia; salt marshes, 1 40.

Sirius, the Dog Star, the most brilliant of all stars, 7 117, 2-490 diag.

Sirius. Early trans-Atlantic steamship, 7-28 illus.

Sirocco. Warm southerly wind, dry and harmful to vegetation, 7 159.

Sirut. R. of Rumania. Rises in Carpathian mts., and flows s. to the Danube, 6 170.

Sisal. A fibre from large leaves of *Agave sisalana*, native to Mexico, 7 58, 1-68, 4 161, 1 62 illus.; paper made from, 6 63.

Siskin. Bird of the finch family, native to Asia and Europe, 3 353.

Sisley, Alfred (1810-99). Brit. painter attached to Fr. school; landscape by, 4-237 illus.

Sisters of Mercy. R.C. order, founded in Dublin in 1827 by Catherine McAuley, devoted to visiting the sick, protecting women in distress, and instructing poor girls.

Sistine [sis'ten] Chapel. Private papal chapel in Vatican built by Pope Sixtus IV; Michelangelo's frescoes, 7-43; Botticelli and 2-26; Raphael cartoons, 6-361; The Last Judgment, 5-191.

Sistine Madonna. Painting by Raphael, 5 69.

Sisyphus [sis'ifus]. In Gk. myth., King of Corinth, notorious for deceitfulness and avarice; for his ineptities he was condemned by the gods perpetually to push up hill an enormous stone, which as soon as it reached the top always rolled down to the bottom.

Sitidae. Latin name for nuthatch family of birds, 5-186.

Sitwell. Family of Brit. writers, children of Sir George Reresby Sitwell. Dame Edith Sitwell (b. 1887), poet, wrote odd but clever verses, later with deeper note, as in *Song of the Cold* (1945), also study of Alexander Pope and critical works, 3-291. Sir Osbert Sitwell (b. 1892), novelist and poet; notable autobiog. 1945-49. Sacheverell Sitwell (b. 1897), poet and art critic; *Southern*

Baroque Art (1924); *Collected Poems* (1936).

Siva. In Hindu religion, god of destruction and reproduction, 4 178, 7 514; bronze figure, 4-250 illus.

Siwa [sa'wa] or **Siwah**. Oasis in Libyan Desert; in anc. times seat of the oracle of Jupiter Ammon.

Siwash Indians. Red Indian tribe, sweat hut, 6-375 illus.

Six Nations. Confederation of Amer. Indians; name given to the Iroquois; towards the close of the 16th cent. a league was formed comprising 5 tribes or nations - the Mohawks, Oneidas, Onondagas, Cayugas, and Senecas - and in 1715 the Tuscaroras were added.

Sixpence. Brit. coin, 5-233 illus. f.; Irish coin, 4-285 illus.

Sixtus IV (Francesco della Rovere) (1414-84). Pope, elected in 1471; built famous Sixtine or Sistine Chapel; a party to the stabbing of Giuliano de' Medici.

Sixtus V (Felice Peretti) (1521-90). Pope, elected in 1585; reformed abuses in Rome, limited number of cardinals to 70, and re-established discipline in the Church.

Skagen. Denmark, town and cape at S. tip of Jutland, pop. 6,400; 3 71.

Skagerrak. Arm of North Sea between Denmark and Norway, 3-72, 1 357; depth of North Sea, 5 160; map, 5 163.

Skanderbeg. See *Scanderbeg*.

Skate and Ray. Edible sea-fishes, 7-58; egg, 3 171 diag.

Skating. Sport, 7 59; action of skates on ice-surface, 3-166; skates for ice-hockey, 4-232.

Skogness. Seaside resort of Lincs, Eng.; pop. 12,551; 4 512.

Skeleton, in anatomy, 7 60, 1-111 diag.; apes and Man compared, 1-180 diag.; of birds, 1 153; and bone, 1-518; skull, 7-64; of snake, 7-74 illus.

Skelton, John (c. 1140-1529). Eng. poet and satirist; tutor to Henry VIII; satirised Wolsey and clerical and social abuses; the "Skeltonic" metre of some of his verses is entirely irregular and unconventional ("Why come ye not to Courte?," attacking Wolsey, and "Colin Cloute," attacking the clergy.)

Skene, Loch. Lake in Dumfriesshire, Scot., 3-134.

Sketch-Book of Geoffrey Crayon, Gent. Book by Washington Irving, pub. 1819-20, containing various stories, including *Rip Van Winkle*, 4-296.

Skiddaw. Mt. in Cumberland, 3,051 ft., 4-138.

Skien. Tn. in Norway; pop. 15,150; 5 461.

Ski-ing. Winter sport, 7 61; in Norway, 5 165 illus. f.

Ski-joring, 7 62.

Ski-jumping, 7 62.

Skimmer or **Scissorbill**. A family of sea-birds in which the lower mandible is much longer than the upper and is used to skim the surface of the water for food.

Skin. Covering tissue of an animal, 7 63; and infection, 4-15; pollution, 4-225 diag.; rashes and allergy, 1-112; of sharks, 7-17; sense of touch, 7-301.

Skink. Type of lizard, 4-529, 528 illus.

Skinner's Company, 4-526.

Skins, for leather, 4-466; for gloves, 4-35, 36; skin glue, 4 36.

Skippacks. See *Cleek Beetles*.

Skirrid Fawr. Mt. in Monmouthshire, Eng., 1,596 ft., 5-246.

Skittles or **Ninepins**. Game, 7 63.

Skiver. Book-binding leather, from sheepskins, 4-469.

Skłodowska, Maria. See *Curie, Marie*.

Skoda Works. Great armaments firm of Czechoslovakia near Pilsen, taken over by Czech government in 1936; Fr. armament firm of Schneider-Creusot at one time held half Skoda shares; seized by Germans in 1939; rebuilt, after war-time bombing, in 1946.

Skokholm. Isl. off Pembrokeshire coast, Wales, bird sanctuary, 4 189.

Skopje, or **Uskub**, Yugoslavia. Serbian trade tn.; pop. 91,491; formerly Turkish; captured by Serbs in Balkan Wars, by Bulgarians in 1st World War; leather, dye-stuffs, textile mfrs.; 7-518.

Skua Gulls, in Antarctica, 1-160.

Skull. Bony parts of the head, 7-64, 1-111 diag.; of primitive Man, 5 104 illus.

Skunk. Animal of the weasel tribe with an overpowering odour, 7-64; fur, 3 496.

Sky, colour of, 1 81, 80 diag.

Skye. Isl. of Inner Hebrides, Scot.; area 643 sq. m.; pop. 8,700; 4-275; Bonnie Prince Charlie and, 4-152.

Skye Terrier. Dog, 3 103, 100 illus. f.

Sky-lark. Bird, 4-117, 448; courtship behaviour, 1-457; foot, 1-171 illus.; migration, 5-204 illus. f.

Skyscraper. Very tall building; first built in Chicago, 2 335; in New York City, 5 110, 111 illus., 115 illus.

Slade School of Fine Art. A branch of Univ. Coll., London. Founded by bequest of Felix Slade (1790-1868), opened in 1871. Famous painters who studied at the Slade include Augustus John, Orpen, and Paul Nash; 5-33.

Slaked Lime. See *Calcium*.

Slang, in language, 7 64.

Slapstick comedy, burlesqued origin, 4-133.

Slate. A rock that splits into thin slabs, 7-65; quarrying, 7 78.

Slave Coast. On Gulf of Guinea, Africa formerly resort for slave traders. Now forms the coast of Nigeria and Dahomey.

Slave Lake. See *Great Slave Lake*.

Slave, of Great Slave, River. Portion (300 m.) of Mackenzie R. of Canada 5 61.

Slavery and Serfdom, 7 65; in Africa 1 54; in ant. world, 1 163; Boers and S. African natives, 7 99; Bristol slave trade, 2 73; John Brown and, 2 93; galley slaves 5-333; in am. Greece, 4 76; Hawkins and Negro slave trade 1 134; in Jamaica, 4 337; Lincoln and Amer. civil war, 4 511.

Slavey, r. of Ireland, 4 281.

Slavonian Grebe. Bird, 4 70.

Slavonic Languages, 4-415.

Slavs. A group of peoples of Europe, 7 66, 3 313; migration of, 5-201.

Sleaford. Admin. centre of Kesteven Lines, Eng.; pop. 7,282; 4 512.

Sleep, 7 67, 2-11; hibernation, 4 173; hygiene and, 4 223.

Sleeper. See *Architectural Terms*.

Sleeper, The. Name given to the dyke furthest from the sea in the Netherlands, 5 372.

Sleeping Sickness. Disease carried by tsetse fly, 7 323, 4 15.

Sleipnir. In Norse myth., the eight-footed steed of Odinn, 5 500.

Slesvig. See *Schleswig-Holstein*.

Slide Rule. 7-67, 69 diag.; and arithmetic, 1-237; and logs., 5 17.

Sieve Bloom. Mt. range in Irish Rep. part of boundary between co. Linn and co. Offaly.

Sieve Donard. Mt. of N. Ireland. Highest point of mts. of Mourne (2,796 ft.), 4-281, 3 109.

Sieve Gullion. Mt. in Armagh, N. Ireland, 1,893 ft., 1-212.

Sligo. Co. of Connacht, Irish Rep. area 691 sq. m.; pop. 62,350; (Chesham riv. are the Moy, Eskay, Owenmore, Owenboy. Industries include agric., fishing; coal, lead, copper and iron mined. Co. tn. is Sligo, pop. 15,000.

Slim, F.-M. Sir William J. (b. 1891). Brit. soldier; c.-in-c. Brit. 14th Arm. in Burma, 7-498; c.-in-c. Allied land forces S.E. Asia (1945-46); commandant Imp. Defence Coll. (1946-47); C.I.G.S. (1948-52); field marshal in 1949; apptd. gov.-gen. of Australia, 1953.

Slime Moulds. A type of primitive organisms found on decaying wood.

Sling, use in Balearic Isles, 1 349.

SLINGS

Slings, in first aid, 3-366.
Slip-casting, in pottery making, 6-274.
Slip knot, how to tie, 4-422 illus.
Slippery Elm, Food, 3-237.
Slip-stitching, in sewing, 7-7.
Sliver, in cotton mfr., 2-520.
Sloane, Sir Hans (1660-1753), Brit. collector and physician; F.R.S. (1685), pres. (1727-41); went to Jamaica as physician to the governor in 1687; there collected plants and curiosities of which he published a catalogue in 1696; purchased manor of Chelsea (1712); Hans Place, Sloane Street, Sloane Square, etc., named after him; left collections to the nation, and these, with another collection, were opened at British Museum in 1759; 5-299, 2-88.
Sloe, Fruit of the blackthorn, *Prunus spinosa*, 6-228.
Sloth, Nocturnal mammal native to Cent. and S. Amer., 7-68; claws, 5-102, 103 illus., 3-413 illus.; 2-45 illus.
Slot Machine, 7-68.
Slough (slow), Tn. in Bucks, Eng.; industrial centre; pop. 66,139; 2-105.
Slough of Despond, in Bunyan's *Pilgrim's Progress*, 2-126.
Slovakia, Former prov. of Czechoslovakia. *See* Czechoslovakia.
Slovaks, Slavic race-group, 7-66.
Slovenes, Slavic race-group, 7-66.
Slovenia (slóvéniá), Constituent part of Yugoslavia, includes portions of former Austrian territory of Carinthia, Carinthia, Styria, and Istria, 7-518.
Slow-combustion Fire, 4-149.
Slow-worm, A legless lizard, 7-70, 4-529.
Sloy, Loch, Dunbartonshire, Scot.; hydro-electric station, 4-217.
Slug, in printing, 2-1; in "Lino-type" machine, 4-516, 518 illus.
Slugs, Shell-less land snails, 7-74, 5-233.
Slump, Economic depression; of 1930-32, 3-317, 4-10.
Sluys (sluis) or Sluis, Battle of, Fr. defeated off Dutch coast by Eng. and Flemish fleets under Edward III (1340), 4-203, 3-313 illus.
Small Copper butterfly, 2-139 illus.
Small Heath butterfly, 2-141 illus.
Small Meadow Brown, or Gatekeeper butterfly, 2-138 illus.
Smallpox, A disease, 7-373; Jenner and vaccination, 4-360.
Small Ringlet butterfly, 2-141 illus.
Small Skipper butterfly, 2-141 illus.
Small Tortoiseshell butterfly 2-138 illus.
Small White butterfly, 2-139 illus.
Small Yellow Wave moth, 2-144 illus.
Smalt (smawlt), A cobalt-blue pigment, obtained from ore Smaltite.
Smart, John (1741-1811), Brit. miniaturist, 3-258.
Smart weed, or Water-pepper, Annual herb (genus *Polygonum*) which grows in wet places; so called from acrid juice which will inflame tender skin.
Smeaton, John (1724-92), Brit. engineer; started as a maker of mathematical instruments, but later turned to engineering; designed the third Eddystone lighthouse; built some bridges in Scot.; surveying engineer for the Forth and Clyde Canal; and hydraulic cement, 2-289.
Smell, sense of, 7-71; in insects, 4-264; and memory, 2-41.
Smelt, *See* Fish (list).
Smetana, Bedrich (1824-84), Bohemian (Czech) composer and pianist, called the "Czech Beethoven" (*The Bartered Bride*; *Vltava*).
Smethwick (smeth'ik), Mfr. centro, 3 m. N.W. of Birmingham; pop. 76,397; mfrs. iron products, machinery, chemicals, glass; 7-141.
Smew, Saw-bill duck, 3-131.
Smilax, or Greenbrier, A shrubby climbing or trailing plant related to lilacs; one type yields sarsaparilla.
Smiles, Samuel (1812-1904), Brit. biographer and didactic essayist (*Self-Help*; biographies of Watt, Stephenson, Wedgwood, etc.).

Smith, Adam (1723-90), Scot. economist, 7-71, 3-160, 6-514.
Smith, Gipsy (Rodney) (1860-1917), Brit. evangelist; special missionary of Nat. Free Church Council (1897-1912) and toured Australia and America; served with A.M.C.A. in France during 1st World War; brilliant orator.
Smith, Horace (1779-1849) and **James** (1775-1839), Brit. wits and parodists; achieved fame by vol. of parodies *Rejected Addresses* (1812), of contemporary poets Wordsworth, Byron, Southey, Crabbe, etc.
Smith, Capt. John (1580-1631), Eng. colonial adventurer; and route to India, 1-131; as first colonial writer, 7-363.
Smith, Joseph (1805-44), Founder of the Mormons, 5-263.
Smith, Sir Ross Macpherson (1892-1922) and **Sir Keith Macpherson** (b. 1890), Australian airmen. These brothers made the first flight from Eng. to Australia, Nov.-Dec. 1919, winning the prize of £10,000 offered by Australian government.
Smith, Sydney (1771-1815), Brit. clergyman and author; firm friend of religious toleration, and a famous wit; called Macaulay a "book in breeches"; a founder of the *Edinburgh Review*; anecdote, 7-296.
Smith, William Henry (1825-91), Brit. business man and politician; developed the Ry. bookstall and circulating library, expanding newsagents' business successfully run by his father of same name (1792-1865); first lord of the Admiralty (1877), sec. for war (1885); followed Lord R. Churchill as leader of House of Commons (1886).
Smith, Sir William Sydney (1764-1840), Brit. sailor. In 1799 defended Acre against Napoleon. Sank Turkish fleet at Abydos (1807).
Smith-Dorrien, Sir Horace Lockwood (1858-1930), Brit. soldier; served in Zulu War, in Egypt, Sudan, South Africa and India; in 1st World War commanded 2nd Corps and later 2nd Army; c.-in-c. East Africa (1915-16); governor of Gibraltar (1918-23).
Smithfield, Historic dist. in London, N.W. of St. Paul's, formerly jousting field and place of public executions; chief central meat market; 5-21.
Smithfield, Tn. in Orange Free State, S. Africa, 5-524.
Smithson, James (1765-1829), Brit. scientist, son of first Duke of Northumberland; F.R.S., founder of Smithsonian Institution at Washington, U.S.A.
Smoke, and smoke abatement, 7-71; behaviour as an aerosol, 2-155; why it rises, 6-185; smoke signals, 7-51.
Smoke box, of locomotive, 5-2.
Smolensk (smolensk'), One of the oldest Rus. cities on Dnieper r.; pop. 156,000; strategic key to Russia; taken by Fr. (1812); in 2nd World War, 7-491, 492, 493.
Smollett, Tobias George (1721-71), Brit. novelist. (*Humphrey Clinker*, *Roderick Random*), 5-171, 3-288, 3-135.
Smolt, A young salmon, 6-190.
Smooth Hound, Type of shark, 7-18 illus.
Smooth Mail-shell, A mollusc, 5-232 illus. f.
Smooth Venus, A mollusc, 5-232 illus. f.
Smuts, Jan Christiaan (1870-1950), Distinguished South African statesman, philosopher, and soldier, 7-72; in Boer War, 1-503; in 1st World War, 7-180; and S.W. Africa, 7-92; and League of Nations, 4-163; and Brit. Commonwealth, 2-84.
Smyrna, Spt. in Turkey on w. coast of Asia Minor; pop. 230,538; 7-73, 7-332; caravan bridge, 2-61.
Smyrna Figs, 3-351.
Smith, Dame Ethel Mary (1858-1944), Brit. composer. Works include Mass in D (1893); *The Wreckers*

SNOWDONIA

(opera, 1906); *File d'Amie*, Supporter of militant suffragists.
Smythe, Francis Sydney (1900-1919), Brit. mountaineer and author; on expeditions to Kanchenjunga (1930), Kamet (1931), and Everest (1933, 1936 and 1938); books *Kamet Conquest*, *The Spirit of the Hills*, *The Valley of Flowers*, etc.
Smythe, Patricia Rosemary (b. 1925), British born woman, winner of many international show jumping contests; autobiography, *Jump for Joy* published 1954.
Snaefell, Highest point in Isle of Man, 2,034 ft., 5-110.
Snails and Slugs, 7-73, 7-24 illus. f., 1-157 illus.; egg, 3-171 diag.; eye, 3-333 illus.; hibernation, 4-173; water-snails, 1-188.
Snake-charming, 2-136.
Snake Dance, A ceremonial dance of the Hopi Indians of N. Amer. in which the dancers carry live snakes in their hands and mouths.
Snake Fly, Insect of order *Neuroptera*, fam. *Raphidiidae*; named from its long flexible "neck", found in Europe and Pacific coast states of U.S.A.; egg, 3-171 diag.
Snake River, U.S.A., Chief tributary of Columbia r.; rises in Yellowstone Park, flows through S. Idaho, then to Columbia in S. Washington; length, 1,009 m.; irrigation in Idaho, 4-234; in Oregon, 5-532.
Snakeroot, A name given to various plants which are or were supposed to cure snake bites; among these the black snakeroot (*Cimicifuga racemosa*), and Seneca snakeroot (*Polygala senega*) of the milkwort family are common in the U.S.A.; Canada snakeroot is the wild ginger.
Snakes, Reptiles, 7-74; cobra, 2-136; fangs, 7-102; fossil, 3-125 illus.; grass snake's egg, 3-171 diag.; mongoose and, 5-239; python, 6-315; rattlesnake, 6-366; tongue of, 7-291; vipers, 7-102.
Snardragon, *See* Antirrhinum.
Snare, In music, catgut strings stretched across a drum-skin to increase resonance.
Snehaetta, Mt. in Norway (7,615 ft.), 5-162.
Snipe, Small wading bird, 7-75; drumming of, 1-157.
Snook (snook), S. African fish (*Thysites atani*) fam. *Gempylidae*, belonging to same order as perch; may be 4 ft. long; weighs up to 16 lb.; much tinned snook exported to U.K. in food shortages after 2nd World War.
Snooker, Game, 7-76.
Snorri Sturluson (Storlason) (1179-1241), Icelandic historian and official; author of *Heimskringla* (sagas of Norwegian kings) and collector and editor of the *Younger*, or *Prose Edda*, 4-231.
Snort or Schnörkel, Device attached to submarine for removing air while submerged, 7-175, 177 illus.; 4-294; 5-349.
Snow, John (1813-1858), First doctor to specialise as an anaesthetist; treated Queen Victoria, 1-113.
Snow, Atmospheric vapour frozen into ice crystals, and falling to earth in white flakes, 7-77.
Snowball Tree, Cultivated variety of the guelder-rose (*var. sterilis*), in which all the flowers are of the sterile type, forming showy, ball-like masses. *See* Guelder-rose.
Snowberry, Ornamental shrub with clustered white berries; honeysuckle family; seeds, 6-529 illus.
Snow Bunting, Bird; migration, 5-204 illus. f.
Snowden of Ickornshaw, Philip Snowden, Viscount (1864-1937), Brit. Labour leader; crippled from youth, he became Labour M.P. 1906, and was chancellor of the exchequer in 1924 and 1929-31; lord privy seal in Nat. govt. 1931-32; 5-626.
Snowdon, Mt. in Carnarvonshire, Wales, 3,560 ft., 2-88, 7-77, 7-412, 411 illus., 1-80.
Snowdonia, Mountain group and national park in N. Wales, 7-77

SNOWDROP

Snowdrop. A small low plant with bulbous roots, 7-78.
Snowfall. In Antarctica, 1-164.
Snow Fleas. See Springtails.
Snow Leopard. or Ounce, 5-101 illus.
Snow-line. 7-77; of Himalayas, 4-178.
Snow-plough. in *slu-ing*, 7-82.
Snowy Owl. Variety of owl, normally inhabiting the Arctic wastes, 6-11, 12 illus.
Snuff. Tobacco prepared for inhaling; also made from acacia, 1-8.
Snuffing. of candles; and plaited wicks 2-210.
Snyders, Franz (1579-1657). Flemish painter; studied under Van Balen and Peter Brueghel the younger. Rubens employed him to paint fruit into his pictures; 6-382.
Soaking. in mfr. of leather, 4-466.
Soane. Sir John (1753-1837). Brif. architect; designed Bank of England; founded Soane Museum; 1-362.
Soap. 7-78; alkalis in mfr., 1-112; caustic potash in, 6-272, 273; colours in soap-bubbles, 2-463; as detergent, 3-78; kelp ash in, 6-528; and water, 7-427.
Soap flakes. 7-80.
Soap Nut. Fruit of the tropical or subtropical soapberry tree; found chiefly in W. Indies, but also in s. Florida, U.S.A.
Soap powders. 7-81.
Soapwort. or Fuller's Herb. Perennial plant of the *Caryophyllaceae* family, 2-24 illus. f.
Soar. King. River rising just within Warwickshire and flowing through Leicestershire and Nottinghamshire to the Trent; 40 m. long; 4-476.
Sobieski (sobies'ki), John (1621-96). King of Poland (John III) elected 1674; freed Hungary, and became hero of Poland; 6-239, 7-335.
Soccer. See Association Football.
"Soccer," in darts, 3-61.
Social and Welfare work; Quakers and 6-317; as career, 2-240.
Social Contract. The. Work by Rousseau which provided the Fr. Revolution with a philosophical basis, 6-459.
Social Credit. in Alberta, 1-91.
Social Insurance. 4-271; scheme introduced by Bismarck (1883), 1-475; pensions, 6-120.
Socialism. 7-81; co-operative societies, 2-499; Marx and, 6-139. See also Communism; Labour Party; National-Socialism.
Social Science. as a career, 2-230.
Society Islands. Isl. group in s. Pacific, including Tahiti. Consists of 11 isls. divided into Windward and Leeward clusters. Total land area 637 sq. m.; pop. 19,000. Tahiti is chief isl.; 6-28.
Society of Friends. See Quakers.
Society of Jesus. See Jesuits.
Socks. or "Half hoses"; knitting machine for, 4-419.
Sokotra (sokō'tra), or Sokotra. An island under Brit. control off E. coast of Africa at entrance to Gulf of Aden; area 1,382 sq. m.; est. pop. 12,000; dates, gums, livestock, butter; 1-19.
Socrates (c. 470-399 B.C.). Gk. philosopher, 7-81, 4-94, 6-160; Aristophanes, 1-287; Plato and, 6-222; death by hemlock, 4-161.
Soda (sodium carbonate). Compound of sodium which, when crystallised with water forms ordinary washing soda; in crude form called soda ash, 1-111, 2-321, 7-82; produced by Leblanc process, 4-215.
Soda Bread. 2-52.
Soda-lime feldspar. plagioclase feldspar, 3-343.
Soda water. Water charged with carbon-dioxide gas, 2-220.
Soddy, Frederick (b. 1877). Brit. scientist; authority on radium and radio-activity. Writings include *Chemistry of Radioactive Elements*; *Cartesian Economics*; *Money Versus Men*; *Interpretation of the Atom*. Awarded Nobel prize for chemistry in 1921; originated theory of atomic disintegration; isotopes, 4-301; and Rutherford, 6-482.

Söderblom, Lars Olof Jonathan (Nathan) (1866-1931). Swedish divine; Archbishop of Uppsala (1914-31); awarded Nobel peace prize (1930); did much to promote the unity of the Christian churches and was an authority on Persian religion (*Religious Culture*; *General History of Religion*).
Sodium (Na). Soft silver-white element of the alkali metal group; atomic no. 11; atomic weight 22.997; melts at 98° C., 7-82, 2-224, 1-112.
Sodium bicarbonate. 1-11; domestic uses, 6-492.
Sodium carbonate. See Soda.
Sodium chloride. Chemical name for common salt, 6-492, 2-318 with diag.; in human body, 5-177.
Sodium hypochlorite. as bleach, 1-484.
Sodium hyposulphite. Known in photography as "hypo"; chemical is really sodium thiosulphate; as fixing solution, 6-182.
Sodium light. wavelength, 4-500.
Sodium nitrate. Chemical name for salt petre, 6-492.
Sodium silicate or Waterglass. Sodium salt of silicic acid, used for preserving eggs, 7-53.
Sodium thiosulphate. as fixing solution in photography, 6-182, 7-187.
Sodium tungstate. used in fire-proofing cloth, 7-324.
Sodium vapour lamp. 3-220.
Sodom. Apple of. Name of various prickly or spiny weeds of the nightshade family.
Sodom and Gomorrah. In Biblical geography, cities in Palestine destroyed for wickedness; and Dead Sea legend, 3-55.
Sodor and Man. Diocese of the Church of England, 5-110.
Sourabaya. See Sourabaya.
Soult. See Architectural Terms.
Soula. Cap. of Bulakia, situated in Rhodope Mts., pop. 134,888, 7-32.
Soft-ground etching. 3-300.
Soft-paste porcelain. in pottery making, 6-277.
Soft water. 7-427.
Softwoods. types and uses, 3-421, 7-277.
Sogne Fjord. Long, deep, narrow inlet on s.w. coast of Norway, 6-462.
Soho. Foreign quarter in W. London noted for its restaurants, 6-28.
Soil. 7-83; earthworms and, 3-154; erosion in Oklahoma, 5-507 illus.; forests and soil erosion, 3-420; adapted for gardening, 3-503; influence of trees upon, 7-313.
Solisma (saw'h'sawn). Historic tn. of N. Fr., 55 m. N.E. of Paris on Aisne r.; pop. 18,174; fine 13th-cent. cathedral shattered by Ger. shells 1918; restored and reconsecrated 1937; 7-482.
Soke of Peterborough. Admin. dist. around Peterborough, Northants, Eng., 5-456.
Sokol (Czech, falcon). Czech patriotic and gymnastic organization for youth of both sexes, estab. 1862. Became embodiment of Czech nationalism. Under Communist régime set up 1948 Sokol membership was made compulsory.
Sokolovsky, Vasilii D. (b. 1899). Russ. soldier; under Koniev captured s. Poland, 1945; made marshal 1946; c-in-c. Soviet occupation force in Ger. 1916-49; imposed blockade of Berlin in 1948 after Western powers announced currency reforms; chief of staff, 1953.
Sokotra. See Socotra.
Sol. See Money (list).
Sol. Form of colloid, 2-455.
Solanaceae. Family of plants including nightshades, potato and tomato, 5-439, 7-290.
Solar Day. 7-277, 3-55.
Solar Eclipse. 5-257.
Solar Month. 5-255.
Solar Plexus. One of chief nerve centres, situated behind stomach.
Solar System. 7-188, 1-275 diag.; comets in, 2-473; Copernicus's theory, 2-501; distance of planets from sun, 1-282. See also Astronomy; Planets; Sun.

SOLVAY

Solders. Metal alloys used in making joints, 1-116.
Soldier. See Army.
Sole. See Fish (list).
Sole Bay. Alternative name of South-wold Bay, Suffolk.
Sole Bay, Battle of. Naval encounter in 1672 during the third Dutch war; whilst the Eng. and Fr. fleets were in Sole Bay they were attacked by the Dutch, who withdrew on the appearance of Brit. reinforcements.
Solenoid. A coil of wire wound in the form of a cylinder so that its length is large compared with its radius. When a direct current is passed through the wire the solenoid behaves like a bar magnet, 5-85 (diag.). Solenoids have many applications in relays and electronic devices (*q.v.v.*).
Solent. Channel, between W. Hamp-shire and the Isle of Wight, 8 m. s. of Southampton; famous yacht-ing waters.
Soles. of shoes; in shoemaking, 2-16.
Solfarino (solfar'ino). It. v.u. 20 m. N.W. of Mantua; Austrians defeated (1859), 4-316; Dunant and the Red Cross, 6-370.
Solicitor. Officer of the Supreme Court of Judicature, admitted to practice law on behalf of clients by advice and in the briefing of barristers, but allowed to plead only in the lower courts; career as, 2-240.
Solicitor-General. A law officer of the Crown; his position is immediately below that of the attorney-general; he acts as a legal adviser to the govt.
Solids; and crystals, 3-6; molecule 4-520.
Solid solution. In metallurgy, 1-11.
Sollingen (zöllingen). Ger. mfg. city in North Rhine-Westphalia, pop. 147,845; 4-5.
Solis (solis), Juan Diaz de (1470-1516). Sp. navigator, 1-225.
Solitaire (solitair). An extinct bird of the night-pigeon family; not unlike the dove; inhabited tropical islands, 3-100; also indoor game with marbles; also a single gemstone on a ring or other ornament.
Sollum. Small pt. and gulf of Egypt on w. border with Tripoli; in 1st World War Brit. base in ops. against Senusi; in 2nd World War changed hands 5 times, finally being occupied by Brit. 8th Army after Alamein victory; 7-189.
Solo. In music, formerly an unaccompanied performance by a voice or instrument; term now used to denote any important or prominent passage of a solo nature.
Sologub, Feodor (1863-1927). Pen name of Feodor Kuzmich Teternikov. Russ. novelist and poet, 6-480.
Solomon (d. c. 937 B.C.). King of Israel, and son of David, 7-83; prosperity of Israel, 4-374; and Tyre, 6-161.
Solomon. Professional name of Solomon Cutler (b. 1902). Brit. pianist, excellent in the playing of Brahms and Beethoven.
Solomon Islands. Groups of Pacific volcanic isls. 1,000 m. N.E. of Australia; N. group under U.N. trusteeship admin. by Australia, s. group Brit. protectorate; area 17,000 sq. m.; pop. 132,000; 6-26, 27 illus. stamp, 6-30 illus.; outrigger canoes, 6-31 illus.; in 2nd World War, 7-491, 494.
Solomon's Temple. Palace at Jerusalem, h.q. of the Knights Templars, from which the order derived its name, 4-418.
Solon (c. 638-558 B.C.). Athenian statesman and law-giver; gave Athens a new constitution, increasing powers of the senate and assembly.
Solstices. Points in ecliptic at which sun reaches extreme N. or s. declination, i.e. roughly longest and shortest days, 2-295.
Solvay, Ernest (1838-1922). Belgian industrial chemist, called "Belgian Carnegie" for his benefactions.

SOLVENT

inventor of ammonia-soda or Solvay process of making soda, 2-396; paid huge indemnity to save Brussels from destruction by Germans.

Solvent. Substance, usually liquid, able to dissolve other substances in it to form a solution; in dry cleaning, 4-455.

Solway Firth. Inlet of Irish Sea, between Eng. and Scot., 32 m. wide at entrance and nearly 60 m. long, 2-248.

Solway Moss. Place in Eng. on Scot. border near Carlisle; battle (1542), 2-10.

Solymán I (or Suleiman) the Magnificent (c. 1495-1566). Greatest of the Ottoman sultans, 7-334; and walls of Jerusalem, 4-361.

Somaliland. E. peninsula of Africa between Gulf of Aden and Indian Ocean; comprises former Italian Somaliland, again under administration of Italy since March 1950; Somaliland Protectorate (Brit.), 68,000 sq. m.; French Somaliland, 9,071 sq. m.; 7-84, 1-56; in 2nd World War, 7-189, 490.

Somalis. African people, 1-6.

Somers, Sir George (1554-1611). Eng. navigator; settlement in Bermudas, 1-435.

Somerset, Edward Seymour, Duke of (c. 1506-52). Protector of Eng. in early part of Edward VI's reign.

Somerset. Co. of s.w. Eng.; area 1,613 sq. m.; pop. 551,188; co. tn. Taunton; 7-84.

Somerset House. Brit. govt. building in London, between Strand and Victoria Embankment; built by Sir William Chambers, 1776-86, the east and west wings being added later; apart from King's College (east wing) it houses govt. offices—audit, registration, inland revenue and wills and probate; wills, once proved, can be seen here; also birth and marriage certificates, etc.; 6-135.

Somers Islands. See Bermudas.

Somervell, Sir Arthur (1863-1937). Brit. composer, best known for settings of song-cycles from Tennyson's "Maud" and Houston's "Shropshire Lad."

Somerville, Massachusetts, U.S.A., nrg. and residential suburb, n.w. of Boston; pop. 102,254; 5-145.

Somerville College, Oxford Univ., 6-18.

Somme, r. of N. Fr., 150 m. long; touches Amiens and Saint-Quentin; in 1st World War, 7-479, 480 illus.; in 2nd World War, 7-488.

Somnambulist. A sleep-walker, 7-67.

Sonata, in music; Haydn's influence on, 5-305.

Song of Solomon. Book of Old Testament, called also *Song of Songs* and *Lantiles*; authorship formerly ascribed to Solomon.

Song of the Shirt, The. Poem by Thomas Hood; influence of, 4-192.

Songs of Innocence. Collections of verse by William Blake, publ. 1789, 1-482 with illus. A later collection was called *Songs of Experience*.

Song-thrush, 7-271; eggs, 1-452 illus. f.

Sonic Depth-finder. Instrument for measuring ocean depths, 5-494.

Sonnet. Verse form, 4-329; Italian and Shakespearean forms, 6-234, 3-285, 7-15; Wordsworth and, 7-477.

Sonora [sōndra], Mexico. State on Gulf of California bordering Arizona, U.S.A.; area 70,477 sq. m.; pop. 364,000; cap. Hermosillo.

Sonora, R. of Mexico, in state of Sonora, length 300 m.; flows into small lake, 5-188.

Soochow or Suchow, China. Wealthy silk-mfg. city on Grand Canal 55 m. w. of Shanghai; founded 500 B.C.; pop. 260,000; almost destroyed by Taipings (1860).

Soong Family. Chinese family; the father Soong Yau-ju (1863-1918) owned one of world's largest printing presses in Shanghai; 4 children educated in U.S.A.; eldest daughter Eling (b. 1890) married Kung Hsiang-hsi, who became min. of industry and min. of defence;

the son Tse-ven (b. 1891) founded bank of China, 1935; became prime min. 1944-47, represented China at San Francisco Conf., and became gov. of Kwangtung in 1947; second daughter, Chingling, married Sun Yat-sen; third, Mei-ling, became Mme. Chiang Kai-shek (q.v.).

Sophia [sōfia] (1630-1714). Electress of Hanover, heiress to Eng. crown by Act of Settlement of 1701 (because nearest Protestant heir); mother of George I and ancestress of Hanover-Windsor line of Brit. sovereigns.

Sophists [sōfists], in anc. Greece. A class of teachers of rhetoric and practical philosophy.

Sophocles [sōfōklēs] (c. 495-405 B.C.). Gk. dramatist, 7-85, 3-116; story of Oedipus, 5-505.

Soprano, in singing, 7-57.

Sopwith, Sir Thomas Octave Murdoch (b. 1888). British sportsman; pioneer airman and aeroplane constructor. In 1911 founded Sopwith Aviation & Engineering Co. and built many machines used in 1st World War. A yachtsman, he tried unsuccessfully to wrest the America's Cup from U.S.A. in 1931 and 1937. Head of Hawker Aircraft Co. (Hurricane, Tempest, Hunter, etc.); 7-511, 4-39.

Sorata or Ilampu, Mt. peak in Bolivia, after Aconcagua highest in S. America, 24,500 ft., 1-507.

Sorbonne [sorbōn], Paris institution of theology, science, and letters; founded in 13th cent.; has been university of Paris since 1806; 6-81, 3-150.

Sorghum [sawgum]. A tall, cereal grass, of family Gramineae.

Sorolla y Bastida [sōrōl'vāhēbastē'dah], Joaquín (1863-1923). Sp. impressionist painter, leader of modern Sp. artists; excelled in marine compositions with brilliant sunlight effects.

Sorrel. A species of biennial or perennial herb of the genus *Rumex*; two kinds are found in Eng. in the form of common weeds.

Sorrel Tree. See Sourwood.

Sorrento [sōrrentō]. Resort on Bay of Naples, It.; pop. 7,000; anc. Soruntum, famous for wine; birthplace of Tasso; 4-312 illus.

Sorting, of letters, 6-270 271 illus. 272.

Sorting machine, for sorting punched cards, 2-169 illus.

Sorus. Spore-bearing structures of cryptogams, 6-530.

S.O.S. Radio signal in Morse transmitted by ships in distress; the letters are not abbreviations but were chosen because they are distinctive and easy to transmit.

Sosigenes. Rom. astronomer; and Julian calendar, 2-171.

Sosnowiec [sōsnōvēts], Poland. City in Upper Silesian coalfield, 40 m. N.W. of Cracow; pop. 127,000 textile centre.

Sostenuto. See Musical Terms (Rgt).

Soto, Fernando or Hernando de (c. 1196-1512). Span. explorer; discovered Mississippi r., 1-134, 5-226.

Souffrière, La. Volcano on Basse-Terre, Guadeloupe, Fr. W. Indies (1,871 ft.), 4-100.

Soul, transmigration of, 4-179, 6-311.

Soulbury, Herwald Ramsbotham, Baron (b. 1882). Brit. administrator; gov. gen. of Ceylon from 1949; and constitution of Ceylon, 2-298.

Soult [soolt], Nicholas Jean de Dieu, Duke of Dalmatia (1769-1851). Marshal of Fr.; led decisive attack at Austerlitz; commanded in Sp. against Moore and Wellington, 6-117.

Sound, 7-86; transmission in ear, 3-147; echoes and speed measurement, 3-156; sound track on films, 6-169; microphone, 5-193; recording, 4-56, 7-87-88; sound waves, 7-86; 87, 88, 1-380; ultrasonic, 7-343; vibrations 6-340 illus. f.; and voice, 7-404. See also Radio; Sound Barrier.

Sound, The. Strait between Sweden and Zealand, 3-72 with map.

SOUTHEY

Sound Barrier, 7-88.

Sound-detector, anti-aircraft, 1-171, 172 illus.

Sound-mixer. Machine regulating tone and volume of the sound track of a film, 2-393 illus.

Souple Silk, variety of silk, 7-54.

Sourabaya. City of Java; pop. 250,000; naval base and sugar-exporting centre; 4-353.

Sour wood or Sorrel Tree. A tree of the heath family with clustered white flowers and acid-tasting leaves.

Sousa [sōsə], John Philip (1856-1932). Amer. bandmaster and composer; leader U.S. Marine Band 1880-92, thereafter Sousa's Band, "Washington Post"; "Liberty Bell"; "Stars and Stripes Forever"; "El Capitan"; and other marches.

Sousse. Spt. in Tunisia; pop. 36,566.

South Africa, Union of. Total area incl. S.W. Africa, 790,219 sq. m.; total pop. 12,640,375; area of Union of S. Africa, 472,491 sq. m.; 7-88; map, 7-90; lang. 3-381 illus. f. Afrikaners, 1-66; Boers, 1-61, 1-502, 7-90, 7-308; communications, 7-88; diamond industry, 1-56, 3-82, 83; gold mining, 4-39, 40; law, 4-458; police force, 6-253; population and colour problem, 1-61, 32; scientific stations in Antarctic, 1-170; stamps, 7-113 illus.; trains, 7-89 illus. f., 7-527.

History: discovery and settlement, 7-89, 2-84, 2-217; Transvaal, 7-308; Orange Free State, 6-524; Pretoria, 6-253; Rhodes, 6-393; Boer War, 1-502, 7-308; Smuts, 7-72. See also South-West Africa.

South African Literature, 7-92.

South America. Continent; area about 7,000,000 sq. m.; pop. about 110 million, 7-96; maps, 7-96, 97 f.; Amazon, 1-129; Andes 1-148; snow, 7-77; plants and animals, 6-273, 7-97 illus., 4-530, 5-240; minerals, 7-97; transport, 7-97; trans-Andean rlys., 1-118; Bolivia and revolt against Spain, 1-506; literature, 7-101. See also America, and names of countries and chief cities.

Southampton, Henry Wriothesley, 3rd Earl of (1573-1624), friend and patron of Shakespeare.

Southampton. Spt. of Hants, Eng., at head of Southampton Water, pop. 175,326; 7-101, 4-124; docks, 3-99 illus.

Southampton Bowling Club, 2-20.

Southampton Water. Inlet and harbour extending from Spithead and the Solent 11 m. into Hampshire.

South Australia. State in S. cont. Australia; area 180,070 sq. m.; pop. 730,000; cap. Adelaide; 7-102, 1-318.

South Bend, Indiana, U.S.A. Farm centre and industrial city in N. 75 m. E. of Chicago; pop. 115,000; motor-cars, ploughs, machinery; seat of Univ. of Notre Dame.

South Carolina. A S. Atlantic coast state of the U.S.A.; area 79,493 sq. m.; pop. 2,117,027. See Carolina.

South Dakota. A S. cont. state of U.S.A.; area 76,868 sq. m.; pop. 652,740. See Dakota.

South Downs (hills). See Downs.

Southdown sheep, 7-23 illus.

Southend-on-Sea. Popular holiday resort in Essex at mouth of Thames; pop. 151,830; 3-294.

Southern Alps. Range of mts. in S. Island, New Zealand; highest peak Mt. Cook (12,340 ft.), 5-122, 424 illus.

Southern Cross. A constellation; not visible in N. hemisphere, 7-96.

Southern Railway. Formerly co. of the U.K., 6-356.

Southern Rhodesia. Part of the Federation of Rhodesia and Nyasaland; area 150,300 sq. m.; pop. 2,456,300; 6-391; Victoria Falls, 7-397 illus. f.

Southey, Robert (1774-1843). Brit. poet and prose writer, 7-102; poet laureate, 6-232; and Lake Dist., 4-139.

SOUTH FORELAND

South Foreland. A promontory on the coast of Kent; has a lighthouse with range of 26 m.; 2-87 illus.

South Georgia. Brit. isl. in S. Atlantic, 900 m. S.E. of Falklands; Shackleton's burial place; area 1,000 sq. m.; whaling station; 3-339.

South Island, New Zealand; area 58,093 sq. m.; pop. 625,783; 5-422.

South Magnetic Pole. 7-103.

South Orkney Islands. Brit. group in Antarctic Ocean, 200 m. E. of South Shetlands, 3-339.

South Platte. R. rising in cent. Colorado, U.S.A., uniting with the N. Platte in Nebraska; 550 m. long.

South Pole. 7-103; exploration, 1-163, 6-213; Byrd's flight over, 2-117; the story of Capt. Scott, 6-515; height of troposphere, 1-80.

Southport. Seaside resort, Lancashire, Eng.; pop. 84,057; 4-114.

South Queensferry. Tn. in W. Lothian, Scot.; pop. 2,186; 6-39.

South Sandwich Islands. Isls. in Antarctic Ocean, 3-339.

Southsea. Seaside resort and suburb of Portsmouth, Hants, 6-265.

South Sea Bubble. Name given to collapse (ruining thousands) of project of South Sea Co. in Eng. (1711-20) which proposed to take over national debt in return for annual payments and monopoly of trade with S. Amer. and Pacific Isls.; 7-117; and Bank of England, 1-362.

South Shetland Islands. Chain of mountainous Isls. belonging to Brit. on border of Antarctic region, 500 m. S.E. of Cape Horn, 3-339.

South Shields. Industrial port on r. Tyne, Durham; pop. 106,605; iron and shipbuilding centre; large docks; 5-391.

South Victoria Land, Antarctica. Vast, ice-covered continental plateau S. of New Zealand and extending to South Pole.

Southwark [south'ork]. Borough of London, on the S. side of r. Thames; the cath.; pop. 97,190; Tabard Inn starting point of pilgrims in *Canterbury Tales*.

Southwark Cathedral, London. Chiefly Early English style; fine central tower; built on site of old Augustinian priory.

Southwell. Cath. city and rural dist. of Notts, Eng.; minster, 5-168.

South-West Africa. Territory of Africa; area 317,725 sq. km.; pop. 590,551; cap. Windhoek. A Ger. colony from 1881-1919. After 1st World War mandated to Union of S. Africa. Represented in Union parl. from 1919; 7-89; Smuts and, 7-72.

Southwold. Seaside resort of Suffolk, Eng., at the mouth of Blyth r. 12 m. S.W. of Lowestoft, 7-182.

Sovereign. Gold coin, value £1, issued in Gt. Brit. A 1816; withdrawn soon after outbreak of 1st World War, 5-236; weight in gold, 4-43. The smaller half-sovereign (10s.) was also withdrawn 1914.

Sovereign of the Seas. 17th cent. English warship 7-35.

Soviet Union. See Russia.

Sowing. In agriculture; drilling and sowing machine, 1-72 illus.; Tull's improvements, 1-88.

Soya Bean. 7-103.

Soyer, Alexis Benoit (1809-58). Fr. chef; reorganized victualling of hospitals in Crimean War; wrote several cookery books; and cooking by gas, 3-507.

Spa, Belgium. Watering-place 16 m. S.E. of Liège; pop. 8,000; medicinal springs; 7-130.

Space. and the telescope, 7-248.

Space-band. in type setting, 4-518 with illus.

Space-time Continuum. in relativity, 6-381.

Spades. Suit in playing cards; and sword symbol, 2-221.

Spaghetti. A form of macaroni, 5-57.

Spain. Country of S.W. Europe, occupying most of the Iberian Peninsula; area 190,205 sq. m.; pop. 26,761,338; cap. Madrid; 7-103; map, 7-104; flag, 3-384 illus. f.;

agriculture, 7-110; cork industry, 2-505; minerals, 7-104; the Alhambra, 1-111 illus. f.; bull-fighting, 2-121; Canary Isls., 2-207; Mahomedan library, 5-90; meal times, 5-151; Moors in, 5-260; New Year customs, 5-410; Spanish scenes, 7-101, 105 illus. f.

History. 7-105, 3-314; Moorish conquest, 5-280; under Ferdinand and Isabella, 2-167, 168, 4-301; Inquisition, 4-263; Columbus discovers America, 1-132, 133, 134; under Hapsburgs, rulers, 4-120; under Charles V., 4-8, 3-311, 7-105; colonies in America, 1-136; wars with Fr. in Italy, 4-313; rule in Italy, 4-314, 5-205; Armada and Philip II., 1-210, 6-155; conquest of Honduras, 4-190; House of Bourbon, 2-28; War of the Spanish Succession and decline of Spain, power, 7-105, 1-481, 5-42, 5-132; possessions in Pacific, 6-31; War of Austrian Succession (1740-48), 1-426, 5-125, 1-1; Seven Years' War (1756-63), 7-2; and War of Amer. Independence, 1-139; Peninsular War, 6-116; S. American revolutions, and Argentina, 1-226; under Alfonso XIII., 1-102; civil war, 1936-39, 6-185, 7-110, 3-317, 4-476; in 2nd World War, 7-111.

RULERS OF SPAIN (FROM 1479)

HOUSE OF ARAGON
1469 1504 Ferdinand and Isabella
(Union of Castile and Aragon)
1504 16 Ferdinand, King of all Spain

HOUSE OF HAPSBURG
1516 56 Charles I
1556 98 Philip II
1598 1621 Philip III
1621 65 Philip IV
1685 1700 Charles II

HOUSE OF BOURBON
1700 46 Philip V
(1724 Louis I six months)
1746 59 Ferdinand VI
1759 88 Charles III
1788 1808 Charles IV
1808 Ferdinand VII

HOUSE OF BONAPARTE
1808 13 Joseph Bonaparte

BOURBON RESTORATION
1814-33 Ferdinand VII
1833 68 Isabella II
(1868-70 Provisional Government)

HOUSE OF SAVOY
1870 73 Amadeo I
(1873-75 Republic)

HOUSE OF BOURBON
1875 85 Alfonso XII
1885-86 Maria-de-la-Mercedes
1886 1931 Alfonso XIII
(1931-1939 Republic)
(1939-1947 Dictatorship)
(1947 Monarchy without King)

Spalato. See Split.

Spalding. Tn. in Lines, Eng.; pop. 11,139; bulb growing, 4-512.

Spandril. In architecture, the space over the haunch of an arch and between it and the overlying rectangle; between the estrados of an arch and the square head of dripstone over it; also the space between the outer mouldings of two arches and the strong-course above them.

Spaniel. Large group of dogs (some sporting) distinguished by broad and short skull, high forehead, heavy build, large pendent ears. Originated in Spain, hence name; 3-102. See also Dogs (list).

Spanish Armada. See Armada.

Spanish Art and Architecture. 7-112, 113 illus.; painting, 6-34. See also individual artists by name.

Spanish Chestnut. See Chestnut.

Spanish Fly. See Blister Beetle.

Spanish Guinea. See Rio Muni.

Spanish Literature. 7-121; language,

SPECTROSCOPE

4-449; drama, 3-119. See also **Spanish Literature (list).**

Spanish Main. Formerly Span. possessions on Amer. mainland from mouth of Orinoco r. to Yucatan; loosely the neighbouring Caribbean Sea. "Sailing the Spanish Main" meant adventuring as pirates into waters off these coasts. Drake and Hawkins undertook several expeditions to Spanish Main, 1572-77.

Spanish Moss. A flowering plant, 5-273.

Spanish Netherlands. S. part of the Low Countries still held by Sp. after independence of United Provinces (corresponding in general to modern kingdom of Netherlands) was recognized 1648; ceded to Austria 1713; corresponds in general to modern Belgium.

Spanish Succession, War of (1701-13) 7-105; battle of Blenheim, 1-184; Louis XIV and, 5-42; Marlborough, 5-132.

Spanish Town. Tn. in Jamaica; pop. 12,007; 4-337.

Sparkling Plug. in motor vehicle, 5-279.

"Sparks." Nickname given to radio operators; origin of name, 4-259.

Sparks, electric. 4-277.

Sparling. Scot. name for common smelt small fish of salmon family.

Sparrow. Bird of the finch family, 7-123.

Sparrowhawk. Bird of prey, 4-140, 6-152 illus. f.; nest, 1-464 illus.

Spars. See Nautical Terms (list).

Sparta. City-state of anc. Greece, 7-123; in Gk. hist., 4-76, 77; Leonidas at battle of Thermopylae, 6-130; war with Thebes, 7-260, 267; war against Troy, 7-320; art of, 7-125 illus.

Spat. Name given to young oysters, anatomy of, 6-21.

Spathe (spā'h). A leaf-like envelope protecting certain kinds of flower bud.

Spatulate. Bot. term for a spoon-shaped leaf type, e.g. London Pride, 4-471 with illus.

Spawn. Eggs of fishes, amphibians, molluscs, and other animals, especially when in masses.

Speaker. The presiding officer in various legislative assemblies. In U.K. House of Commons the Speaker is elected, but upon taking chair loses all political identity; he may not take part in debates, and votes only in case of a tie; because of non-partisan character he is frequently re-elected in spite of change of party majority, and upon retirement customarily receives a peerage. In U.S. Congress he is elected by members of house of representative and is leader of party in power; he is free to take part in proceedings by calling another member to the chair, and by rulings wields tremendous political power, 6-88.

Spearmint. A perennial herb (*Mentha spicata*) found in various parts of Europe; extensively used in cooking; has a pungent odour, 5-222.

Spear Thistle. 7-270.

Special Licence. for marriage, 5-135.

Species. Term in biology, 2-24; classification of animals and plants, 1-10, 1-451; differences among, 3-321.

Specific Gravity. 7-124; measured by hydrometer, 4-222.

Specific Heat. 4-148; of water, 7-121.

Specific Inductive Capacity. See Permittivity.

Speckled Wood butterfly. 2-110 illus.

Spectacled bear. A small bear of the Andes Mts. (*Tremarctos*), with yellowish goggles-like rings about its eyes; it is thought by some scientists to be a sub-species of the American black bear.

Spectacles. 7-126; lenses for, 4-182.

Spectator. The Eng. newspaper founded by Addison and Steele, 1-16, 7-154.

Spectrograph. Instrument for photographing spectra, 6-109, 7-128.

Spectroheliograph. in observatory, 6-493.

Spectrometer. 7-128, 127 illus.

Spectroscope. Instrument for observing

SPECTRUM

and analysing light spectra 156 in astronomy, 1-284, 6-493, 7 127 and stars, 7-148, and sun, 7 190
Spectrum and Spectroscopy, 7 127 in atomic research, 3 221, the full spectrum, 2 464 illus 1, X-ray spectra, 7-508, Newton's experiments, 7 128 illus 1
Speculation See **Stoek Exchange Terms**
Spee [shpā], Count Maximilian von (1861-1911) Ger admiral, victor at Coronel Nov 1914 over Brit under Sir C. Craddock, went down with his ship *Scharnhorst* off Falkland Is. in Dec 1914 in action won by Sir Doveton Sturdee
Speech, organs of, 7 404, brain cells in Man and ape, 4-180 and tongue 7-291
Speed, of light, 4 498, of sound, 3 156, of stars 3 282 284
Speed-boat, jet engined speed boat 1 301 illus
Speedometer Device for measuring speed in motor vehicle 6 282 & 37
Speedway Racing, 5 274 illus
Speedwell Name given in Brit to herbaceous members of genus *Veronica* of fam *Scrophulariaceae* common species are *Germander Speedwell* or *bird's eye* and *Brooklime* a species found in ditches, other species are mostly small inconspicuous weeds all have bright bluish flowers and opposite simple leaves
Speier (Ger.) See **Spire**
Speke, John Hanning (1827-64) Brit explorer, discoverer of source of the Nile 7 397
Spelling, 7 128
Spelter, commercial 7 21 7 23

Spence, Basil Urwin (b 1907) Brit architect, and Coventry cathedral 2 522
Spencer, Herbert (1820-1903) Brit philosopher attempted to organize all knowledge into a system on scientific and especially evolutionary lines (*Synthetic Philosophy*, *Data of Ethics*, *Education*, *Principles of Psychology*, *Social Statistics*) other works see *Study of Sociology* 6 160
Spencer, Stanley (b 1891) Brit painter of mystical subjects, showing sacred and angelic characters in contemporary dress and settings. His "Christ Bearing the Cross" and "The Resurrection" are in the Tate Gallery, elected ARA (1942) but resigned in 1945 when two of his pictures were refused to be elected ARA and elected RA in 1950 3 273 with illus
Spender, Stephen Harold (b 1909) Brit poet and critic. Works in *Under the Turning Tides*, *Forward from Liberalism*, *Joural of a Jute*
Spengler, Oswald (1880-1936) Ger philosopher best known work *Die Entartung des Westens* (The Decline of the West) aroused much controversy on account of its revolutionary pessimism. In Spengler's view Western civilization had passed its height and democracy was giving way to dictatorship
Spenser, Edmund (c 1552-99) Eng poet 7 130 and *The Faerie Queene* 3 254 Sidney and 7 1
Spenserian Stanza, in poetry 6 234
Spermatozoa Waxy substance obtained from head of sperm whale 7 142
Spermaphyta Group of seed producing plants 6 214

SPIDERS

Sperm oil, obtained from the sperm whale 7 42
Sperm whale *Phocaena* 1 11 in Antartic 1 10 ivory from 4 431 with sperm oil and tallow 7 1 2 43 44 illus
Spermin The Mite in N. Ireland highest point is Snow Mt 4 281 7 312
Spey [spei] Second largest river of Scotland in the highlands 6 1 clay and loam in the lowlands 6 10
Spessa [stai] Ital Spt and pleasure resort of Italy important Italian naval station near here Shell was drowned 7 26 101 111 117
Sphaeristike Early form of lawn tennis invented by Walter Winchell 4 60
Spalierite ore of zinc 7 2
Sphecoidea [sfekoidi] a family of solitary wasps including the mud daubers
Sphere geometry 5 140
Spilix, at Cich 1447 1 130 with illus 3 133
Spica Star of the first magnitude 7 116
Spice Islands See **Moluccas**
Spices and Condiments 7 131 cloves 2 123 ginger 4 21 mustard 5 12 nutmeg and mace 5 186 pepper 6 121 turmeric 7 1
Spider Beetle bookworm habits 1 111
Spider Crab 2 21
Spider Monkey, type of monkey 5 241
Spiders 7 132 133 illus 1 Arachnid legend 1 286 instinctive behaviour 1 152 eggs, living 3 172 eye 3 133 illus 1 3 41 illus with dead hummingbird 7 142 illus 1 under microscope 7 1 3 illus

PROMINENT FIGURES IN SPANISH LITERATURE

El Cantar de mio Cid (Poem of the Cid) about 1140
 El Auto de los Reyes Magos (The Mystery of the Magian Kings) 12th century
Juan Ruiz de Alarcón (1580-1639) dramatist La Verdad sospechosa (Truth Suspected), Las Puras over (Walk-Have Fun)
Mateo Alemán (1547-1614) novelist — Guzman de Alfarache
Luis de Góngora y Argote (1591-1627), poet — El Doctor Carlinio, Angélica y Medoro, Sol dolo (The Solitudes)
Pedro Antonio de Alarcón y Ariza (1833-91) novelist El final de Norma (The Last Act of Norma) El Sombroso de las Picos (The Three Connected Hitt)
Ramón Pérez de Ayala (1851-) novelist and poet Hiar Juan novel El Sendero innumerable poem
Pedro Calderón de la Barca (1600-81) dramatist La Dama duende El Alcalde de Zalamea El Magico prodigioso La Vida es sueño La Cruz del rey Baltasar
Pío Baroja (1872-), novelist — El Mayorazgo de Labraz (The Lord of Labraz), Pirada Rey (Pirade x King), El Arbol de la Ciencia (The Tree of Knowledge), Cesu omada (Cesur or Nothing)
La Condesa Emilia Pardo Bazan (1832-1921) novelist Los Pazos de Ulloa La Madre naturaleza
Lope Félix de Vega Carpio (1562-1635) dramatist and poet "La Carbonaria" Bala Aurora Nache de San Juan San Isidro poem
Guillen de Castro (1569-1631) dramatist — Las Mocedades del Cid
Rosalina de Castro (1837-85) poet — Cantares gallegos La las orillas del Sur
Rubén Darío (1867-1916) poet and critic Azul La Raros "Prosas Profanas" El Canto errante
José Echegaray (1833-1916) dramatist — El Gran Chato (The Great Galeotto), Mariana — El Hijo de Don Juan (The Son of Don Juan)
Benito Pérez Galdós (1848-1920), novelist "Episodios Nacionales", "Doña Perfecta", Gloria La Tormenta (Torment)
Angel Ganivet (1865-98) novelist and essayist La Conquista de Reino de Maya "Idemum Ispanol"
Baltasar Gracián (1601-54) novelist — El Criticón
Antonio García Gutiérrez (1813-84), dramatist — El Trovador inspired opera Il Trovatore
Vicente Blasco Ibáñez (1867-1929), novelist "La Ciudadela" (The Shadow of the Cathedral) La Horda (The Mob), "Los cuatro Jinetes del Apocalipsis (The Four Horsemen of the Apocalypse), "Sangre y Arena" (Blood and Sand)

Juan Ramón Jiménez (1881-) 1 1 1 Anos in Poetry 11
Mariano José de Larra (1809-33) satirist El 11 Fructo hallado a pñ held written actually by Larra
García Lorca (1898-1936) 1 1 poet dramatist A Ymami, Beldes de Sangre (Blood Wedding) Play 11 Poetry in Nueva York poem
Salvador de Madariaga (1881-) novelist and historian La Infortunada (The Suffering Girl) Christ the Columbus Portrait 1 1 1
Jacinto Benavente y Martínez (1866-1934) dramatist Gent Corrida La Tragedia Bb La Gobinades La Malpudria
Juan Manuel (c 1252-1317) short story writer El Cantar de Juan Manuel
Tirso de Molina (Gabriel Téllez) (1571-1648) dramatist El Burlador de Sevilla Don Juan
José Maria de Pereda (1833-1900) novelist Sefiza La Cruz arida Poeta Gonzalo
Joaquin (1833-1914) and **Serafin** (1833-1914) Alvarez Quintero dramatists El Centenario (A Hundred Years Old) La Consuelo (The Lady from Almagro)
José Martiner Ruiz (Azorin) (1874-) novelist and critic La Vuelta de los Reyes Ellos Ellos Ellos
Juan Ruiz (c 1252-1317) 1 1 1 El Libro de Buen Amor
Miguel de Cervantes Saavedra (1547-1616) novelist and dramatist Don Quixote novel Novels and chapters stories La Numancia play
Ramon Sender (1901-) novelist Sender 1 Sender
Gregorio Martínez Sierra (1881-1917) author with Maria de la O Lejarraga (1880-) 1 1 1 19 novelists dramatists under signature Martinez Sierra Ellos de escarlatina verse La Cruz paz novel Cancion de cuna (Cradle Song) play
Miguel de Unamuno (1891-1919) 1 1 1 novelist poet and philosopher Nihil (Nihil) novel Poeta 1 1 1 Sentimiento trágico de la Vida (The Tragic Sentiment of Life) philo opical treatise
Armando Palacio Valdés (1853-1918) novelist — Marta y Maria Jose La Esquina
Juan de Valera (1824-1905) novelist Poeta Jimenez
Ramón María del Valle-Inclán (1870-1930) novelist — Sentido La Guerra civil El Financiero El Financiero
Gil Vicente (1470-1536) dramatist — Auto de la Barca del Inferno (The Smp of Hell) Anadid de Guadalupe
Diego de Torres Villarroel (1626-1779) autobiographer Vida
Francisco de Quevedo y Villegas (1590-1614) satirical novelist — Historia de la Vida del Buscón (The Life and Adventures of Buscon)

SPIDER WEB

Spider Web, 7-133, 134 illus.
Spiegelstein. Alloy of manganese and iron, 5-112.
Spikenard or **Nard**. A costly perfume produced from a plant native to the mts. of N. India; used by the ancients in baths and at feasts; the oil of spikenard mentioned in the Bible was probably an oil of fat scented with the perfume; in the U.S.A. a herb (*Aralia racemosa*) with large spicy aromatic roots is called spikenard. Ploughman's spikenard is a common Eng. roadside plant of family *Compositae*, with yellow flower-heads.
Spike Oil, from lavender spikes; used in making varnish, 4-157.
Spillbury, Sir Bernard Henry (1878-1947). British pathologist. Gave evidence in numerous criminal cases as honorary pathologist to the Home Office.
Spinach [spin'ij]. Garden vegetable, extremely nutritious and valuable for children and invalids. Member of family *Chenopodiaceae*.
Spinal Column, in skeleton, 7-304, 7-60 1-144 diag.
Spinal Cord. The nerve trunk in spine, and nervous system, 2-11.
Spindle Tree. Small tree, *Euphyllia europaea*, so-called because wood was formerly used for spindles. Rarely exceeds 20 ft. in height; grows on limestone soils; leaves bright greenish; leaves narrow, simple; flowers, yellowish, distinguished by fruits, bright pinkish-purple.
Spinnet. Musical instrument, forerunner of the piano, 6-194, 5-309.
Spinneret. Gold or platinum cup perforated with minute holes, through which viscous solution is forced. In rayon mfr., 6-368 illus.; in nylon mfr., 6-188; natural spinneret of silkworm, 7-54.
Spinning, 7-135, 136 illus.; Arkwright and 1-239; Crompton's mule, 2-53; rope, 6-451; spinning-jenny, 4-132; of wool fibres, 7-175; yarn for weaving, 7-434.
Spinning-frame, invented by Arkwright, 1-239, 210 illus.
Spinning-jenny, invented by Hargreaves, 1-239.
Spinosa [spin'osa], Baruch or Benedict (1892-77). Dutch (Jewish) philosopher, called by Novalis the "God-intoxicated man"; belonged to no school and founded none, yet influenced poets and thinkers like Goethe, Lessing, Wordsworth, 6-169.
Spiny Anteater, 1-170, 3-113, 6-305, 5-100.
Spiny Lobster. See *Crawfish*.
Spion Kop. Hill near r. Tugela, Natal, S. Africa, where the Brit. were repulsed by the Boers in Jan. 1900, whilst attempting to reach and relieve Ladysmith, 1-502.
Spira or **Spiraea**. Large genus of flowering plants found in N. temperate regions of the earth; in Eng. meadow-sweet belongs to this genus.
Spires or **Speier**. City in the *Land of Rhineland-Palatinate*, W. Germany, on r. Rhine; pop. 29,500. Tobacco, sugar and wax are chief mfrs. Romanesque cathedral begun in 1030; bishopric one of oldest in Ger. 5-100.
Spires, Diet of (1629), and Protestants 6-376.
Spirillum. Kind of bacterium, spiral shaped, 1-313.
Spirits. Alcoholic liquors obtained from distillation of fermented liquors, 7-136, 3-94.
Spiritualism. The belief that communication can take place between the living and the dead, and that this is the explanation of certain phenomena experienced by many with the assistance of "mediums," i.e., people specially gifted with powers of psychic communication through clairvoyance, trances, automatic writings, and other more objective means. To a certain extent spiritualists are organized as a religious community.

SPURGEON

Spirogyra. A form of green algae found as scum on the surface of ponds, 1-101.
Spit. For roasting in cookery, 2-496, 195 illus.
Spitfire. Brit. fighter aircraft, designed by H. J. Mitchell and made by Vickers-Armstrong Supermarine; first military version 1936; imptr. role in battle of Britain, 2-76, 78, 1-35 illus.; later adapted to many purposes; wing span, 36 ft. 10 ins.; naval version called *Seafire*.
Spithead. Roadstead between Isle of Wight and Hants; about 4 m. wide and joins with Solent and Southampton Water; scene of Jubilee naval review in 1935 and Coronation reviews of 1937 and 1953.
Spitsbergen. Group of isls. in Arctic Ocean, 360 m. N. of Norway; also known as *Svalbard*; area 24,294 sq. m., 7-137; minerals, 5-165, 1-220.
Spleenwort. Various small ferns of the family *Polypodiaceae*; found in Europe, W. Asia and N. and S. Africa; are commonly seen growing among rocks, on walls, etc.
Splice. Method of repairing a broken rope, 4-123 with illus.
Sploit. In bone fractures, 1-518.
Split (Ital. *Spilato*). Spt. of Yugoslavia, on Adriatic Sea; pop. 19,961; 3-28; Diocletian's palace at, 1-14.
Spode, Josiah (1754-1827). Brit. potter, popularised and improved the Willow pattern and introduced the famous Spode ware; his china is held in high esteem by connoisseurs, 6-277.
Spofforth, Frederick Robert (1853-1926). Australian cricketer; fast bowler, regarded by many as greatest bowler who ever lived; member of first Australian team to visit Eng. land, 1878.
Spohr, Ludwig (1784-1859). Ger. composer and violinist; wrote 200 works, including operas, oratorios, symphonies, chamber music; 5-514.
Spokane [spō'kan]. City of Washington state, U.S.A., on Spokane r. near Idaho border; mfrs. include foundry products, machinery, furniture, and brushes; pop. 161,720.
Spoleto [spōl'ito]. It. tn. 60 m. N.E. of Rome; pop. 19,600; Rom. ruins.
Spenside, foot in poetry, 6-233.
Sponge Rubber, manufacture, 6-166.
Sponges. A division of primitive animals, 7-137, 1-157 illus.; in zoological classification, 1-154; in Bahamas, 1-317 illus.
Spong'ia. Fibrous stiffening matter in sponges.
Spontaneous Generation. Doctrine that living forms sometimes arise from non-living matter.
Spoonbill. Bird of stork and heron group, once bred in East Anglia, now seldom seen; 7-168, 169 illus.; name sometimes given to Shoveller-duck.
Spooner, William Archibald (1844-1930). Brit. scholar, garden of New College, Oxford, 1903-24; noted for inverted expressions, called "spoonerisms," e.g. "a half-warmed fish" for "a half formed wish."
Sporades Islands. See *Dodecanese*.
Sporangia (plural of *sporangium*). Spore bearing organs of lower plants, 6-330, 3-348.
Spores. Reproductive cells of sporozoa, microscopic organisms which include malaria germs and tetse disease; bacterial forms, 1-343; of algae, 1-105; and reproduction of cryptogams, 6-329; of ferns, 3-348; of fungi, 3-488, 489; of yeast, 7-513.
Sporophyte. Spore-bearing cases in moss plants, 6-273.
Sporozoa. Class of unicellular animals parasitic upon higher animals.
Sports, or *Mutations* in biology, young organisms markedly unlike their parents; in mutation theory of evolution, 3-354.
Sports, Games, and Pastimes; archery, 1-206; athletics, 1-290; badminton,

1-346; baseball, 1-377; basketball, 1-378; billiards, 1-446; bowls, 2-39; boxing, 2-39; cards, 2-391; charades, 2-304; chess, 2-328; croquet, 2-334; curling, 2-12; cycling, 2-14; dancing, 2-37; darts, 2-50; draughts, 2-122; dominoes, 2-107; fencing, 3-345; fishing, 3-382; flies, 3-385; football, 3-414; gliding, 4-33; golf, 4-44; hawking, 4-14; hockey, 4-183; horse-racing, 4-198; hunting, 4-209; hurling, 4-210; ice-hockey, 4-232; kite-flying, 4-416; lacrosse, 4-135; lawn tennis, 4-160; motor-cycle racing, 5-110, 5-275; mountaineering, 5-284; netball, 5-369; Olympic Games, 5-508; photography, 6-169; physical education, 6-188; polo, 6-254; quoits, 6-328; riding, 6-100; rowing, 6-459; rugby football, 3-414; shooting, 7-42; skating, 7-59; skiing, 7-61; skittles, 7-83; squash rackets, 7-139; stamp-collecting, 7-143; swimming, 7-207; table-tennis, 7-219; tennis (real), 7-256; water polo, 7-430; wrestling, 7-501; yachting, 7-509.
Spotted Eagle, 3-145.
Spotted Flycatcher. Bird; migration, 5-204 illus. f.
Spotted Hyena, 4-223 illus.
Sprains, first aid for, 3-308.
Sprat. A small herring (*Clupea sprattus*) 6 m. long, abundant in the N. Atlantic off the European coast, dry-salted or cured in brine it forms a tasty and nourishing food; 4-172.
Spray, behaviour as aerosol (colloid), 2-435.
Spray-painting, method of applying paint under air pressure, 6-34 with illus.
Spree [sprā]. R. of Germany, rises in Saxony, near Bohemian border, flows N.W. 227 m. joining Havel at Spandau; connected by canal with Oder and Elbe.
Spreevald [sprā'vālt]. Low marshy dist. dotted with lakes and canals in Spree valley, Ger., about 50 m. S.E. of Berlin, about 106 sq. m.
Spring, Howard (b. 1849). Brit. novelist; *O. Abrahm* (repub. as *My Son, My Son!*); *Sam is the Spur*; *Hard Facts*.
Spring, of water, 7-138; geysers, 4-1; Spring, season of year, 6-255.
Spring, mechanical; in clocks, 2-117.
Springbok. Species of antelope, 1-171.
Springfield. Cap. of Illinois state, U.S.A.; pop. 81,628; mfrs. incl. woollengoods, flour, soap, machinery, 4-236.
Springfield, Massachusetts, U.S.A. Industrial centre of New Eng. noted seat of learning; chief mfr. electric vehicles, engines, and general machinery; pop. 162,400; 5-145.
Springfield Rifle, 3-354 illus.
Springtails ("snow fleas"), in Ant. arctic, 1-164.
Spring Tides, 7-275, 4-67.
Spring Usher moth. Member of the winter moth group which has a wingless female.
Spruce. A coniferous tree, 7-139, 2-484; aphid pest, 1-183; cone of 2-483 illus.; products, 3-356.
Spruce Knob. Mt. in Allegheny Mts. U.S.A., 4,860 ft., 4-103.
Spun Glass, 4-30.
Spun Silk, made from waste silk, 7-11.
Spurge. Name of plants of family *Euphorbiaceae*, characterised by strange, usually yellow and green inflorescence, and white juice. Many Old World forms assume same form live in same situations as New World cacti. Commonest English species is wood spurge, typical member of oak-wood flora, tall green plant with yellowish inflorescence.
Spurge Hawk moth, 2-143 illus.
Spurge Laurel, 4-456; poisonous berries 6-236.
Spurgeon, Charles Haddon (1834-92). Brit. Baptist preacher, but Metropolitan Tabernacle in S. London and filled its 5,000 seats; his powerful sermons, translated into many languages, had wide circulation.

SPURN HEAD

Spurn Head. Flat promontory on the s.e. coast of York, Eng., at mouth of r. Humber.

Spurs. Battle of the fought near Throuanne, in Flanders, between the Eng. and the Fr. on Aug. 16, 1513; during an Eng. cavalry charge the Fr. knights spurred away—hence the name.

"Spy." Famous Victorian political cartoonist (real name Sir Leslie Ward (1857-1923). Known for his coloured drawings of contemporary celebrities in *Punch*, now much sought by collectors.

Squadron-leader. In R.A.F., 6-163.

Square Dancing. 3-38.

Square Knot. See Reef Knot.

Square Measure. See Weights and Measures (list).

Square Root. In numbers, 6-475.

Squash (skwosh), a vegetable of the pumpkin family.

Squash Rackets. a game, 7-139.

Squaws. Red Indian women; their importance in the tribe, 6-373.

Squid. Sea creature of the class *Cephalopoda* (octopus, etc.), 3-13.

Squid. Anti-submarine weapon, 5-349.

Squinch. in architecture, a small pendontic arch formed across the angle of a square tower to support the side of a superimposed octagon; also called a scone.

Squire. knight's attendant; training for knighthood, 4-117.

Squirrel. 7-140; foot, 2-413 illus.; fur, 2-496; hibernation, 4-173. For Ground Squirrel see Chipmunk.

Squirrel-cage Motor. Type of electric motor, 5-276.

Squirrel Monkey. S. Amer. monkey, 5-210.

Srinagar (srīnagar), India. Cap. of Jammu and Kashmir, in N. on r. Jhelum, in famous Vale of Kashmir; pop. 207,787; makes paper, papier mâché, silver and copper ware, leather, 4-393.

Staccato. See Musical Terms (list).

Stacking Machine. Fork-lift truck, 4 195 illus.

Stadium (stād'ium). Gk. measure of length (equal to about 606 ft.); term applied to race course at Olympia, which was exactly a stadium in length, and later to similar places for holding athletic contests; reconstruction, 5-510 illus.

Stadtholder. former title of chief magistrate of the Netherlands.

Stahl (stah'l), Madame de (Anne Louise Germaine Necker, Baronne de Staël-Holstein) (1766-1817). Fr. novelist, daughter of financier Necker; enjoyed enormous reputation in her day; banished by Napoleon; chief works, *Delphine*, *Corinne*; 3-512.

Staff (musio). See Musical Terms (list).

Staffa. Uninhabited volcanic isl. of Inner Hebrides, Scot., 7-140; legend of Finn MacCool, 4-18; Fingal's Cave, 4-152; Mendelssohn and, 1-227.

Stafford. Family which held title of Buckingham, 2-103.

Stafford, Henry. Duke of Buckingham (c. 1454-83). Eng. nobleman who rendered great services to Richard III, but went over to side of Henry Tudor, and raised revolt in Wales; was captured and executed.

Stafford, William Howard. Viscount (1614-80). Eng. nobleman, executed on charge of complicity in the "Popish Plot" of Titus Oates.

Stafford. Co. tn. of Staffs, Eng.; pop. 40,275; 7-141; coal measures, 2-426.

Staffordshire. Midland co. of Eng., area 1,153 sq. m.; pop. 1,921,013; co. tn. Stafford, 7-140.

Stag. See Stock Exchange Terms.

Stag. Male deer; antlers, 3-59 with illus.

Stag Beetle (*Lucanus cervus*), 1-415; appearance, 4-266; jaws, 4-266 illus.

Stage. of theatre, 7-263, 264, 265 illus.; pageants, 3-117; eastern costumes

2-41, 42, 43; revolving, 7-265 illus.; in Shakespeare's day, 7-239. See also Drama.

Stage-coach. Public passenger vehicle, 6-411.

Staghorn Moss. See Club Moss.

Stagira (staj'irē). In anc. geography, tn. on coast of Chalcidice, Macedonia; birthplace of Aristotle, who was called from it "The Stagira."

Stahl, Georg Ernst (1660-1734). Ger. chemist, enunciated the phlogiston theory of combustion, 2-317.

Stainer, Sir John (1840-1901). Brit. composer. Organist of St. Paul's, London (1879-88); prof. of music, Oxford, 1889. Wrote sacred cantatas *The Crucifixion* (1887), etc.

Staines. Tn. in Middx, Eng., on Thames; pop. 39,983.

Stainless Steel. An alloy of steel and chromium, 4-296; industrial uses, 2-383.

Staircase. Modern spiral, 2-117 illus.; etiquette towards women on stairs, 2-303.

Stakhanovite (stakah'nōvīt'). Name given to "champion" Russian industrial workers under Soviet; from Alexei Stakhanov, who evolved a system of increasing coal production.

Stalactites. and Stalagmites, how formed, 2-276.

Stalag (Ger. *Stammager*, prison camp). Name for (jer. camps for n.e.os. and men prisoners of war.

Stalemate. in chess, 2-330.

Stalin, Joseph Vissarionovich (1879-1953). Russian Communist leader, 7-141, 6-476; birthplace, 2 276.

Stalin (Tn. in Bulgaria). See Varna.

Stalin Canal. The most northerly section of Baltic-White Sea Canal.

Stalingrad. Tn. and port on riv. Volga, Russia; pop. 540,800; 7-142, 6-412; in 2nd World War, 7-407, 7-493.

Stalin Peak. Highest mt. in Russia, 24,000 ft., 6-478.

Stalky and Co. School story by Rudyard Kipling, 4-113.

Stamboul. The southern and oldest part of Istanbul, 4-304.

Stamen. Pollen-making, or male, part of a flower, 3-397, 398 diag., 2-24.

Stamford. Tn. in Lincs, Eng.; pop. 10,899; agricultural centre; breweries, engineering, and farm implement works, 4-313.

Stamford Bridge. Place in Eng. about 8 m. n.w. of York, where Harold II defeated Norse invaders (Sept. 1066).

Stamp Act of 1765. and War of Amer. Independence, 5-421.

Stamps and Stamp-Collecting. 7-143; 2-453; of Iceland, 4-233 illus.; Luxemburg, 5-51 illus.; Pacific Isls., 6-30 illus.; Panama, 6-53 illus.; San Marino, 6-498 illus.; Somaliland, 7-84 illus.; Vatican, 7-382 illus.

Stanchion. See Nautical Terms (list).

Standard. Battle of the, fought at Standard Hill in N. Riding of York-shire, in 1138, when David of Scot., was defeated by the northern barons.

Standard Gauge. of railway line (4 ft. 8½ ins.), 1-320.

Standard Time. A system by which time becomes uniform over given areas; the areas have a breadth of 15° and the difference in time between two adjacent areas is taken as 1 hour; the world receives its time from the Royal Greenwich Observatory; 7-277.

Standard Version of the Bible. published in America, 1900-01, 1-443.

Standing Rigging. See Nautical Terms.

Standish, Miles (c. 1584-1658). Eng. soldier, military leader of Plymouth colonists (Pilgrim Fathers).

Stane Street. Rom. road on South Downs, Eng., 2-74.

Stanford, Sir Charles Villiers (1852-1921). Brit. composer, b. Dublin, professor at the R.O.M., London, and later at Cambridge; wrote opera, (*Shamus O'Brien*), ballads, and religious music, and was a noted organist; 5-306.

STAVANGER

Stanhope, Lady Hester (1776-1839). Brit. traveller; in Syria, 1-195.

Stanislaus, Saint (1030-79). Bishop of Cracow and patron saint of Poland, slain by King Boleslaus.

Stanley. Famous English family; Thomas Stanley (1435-1505) created first Earl of Derby; Isle of Man granted to (1405), 5-110.

Stanley, Sir Henry Morton (1841-1904). Brit. explorer, 7-144; Congo discovery, 2-481; 1-55; and Leopold II, 2-482; and Livingstone, 4-827; and pygmies, 1-51; and Lake Victoria, 7-397.

Stanley. Cap. of Falkland Isls.; pop. 1,300; 3-339.

Stanley Falls. Cataract on riv. Congo, Africa. Named after Stanley, the explorer, 2-480, 481.

Stanleyville. Trading and administrative station of Belgian Congo on Congo, at Stanley Falls.

Stanovoi (stahnōvōi) Mts., E. Siberia. Range running 2,400 m. n.w. from Mongolia to Bering Strait; 3,000 to 5,000 ft.; s. portion heavily forested.

Staphylococcus. Bacterium; disease caused by, 1-344.

Star. 7-145; constellations, 2-489, 490 diag.; hydrogen in, 4-321; light from, 4-498; nebulae, 5-360; speed of travel and distance from earth, 1-282, 284; and the zodiac, 7-624.

Star Apple. Type of fruit, 3-479.

Starboard. The right-hand side of a vessel, when looking forward.

Starch. 7-149; formed by leaves, 6-132; fermentation produced by yeast, 7-512.

Star, Chamber, Court of. Part of Privy Council which sat in the Star Chamber of Westminster Palace; set up by Henry VII, 4-183; became a tyrannical institution under Stuart, 2-278, 4-453; habeas corpus and, 4-115; abolished in 1641, 6-292.

Starwort. See Wake-Robin.

Starfish and Sea Urchins. 7-150, 1-157 illus. enemies of oysters, 6-24.

Stark, Freya Madeline. Brit. explorer and writer; in Arabia, 1-190.

Starling. Bird, 7-151, 1-457 illus.; egg, 4-453 illus. f.; feeding young, 1-460 illus. f. and insects, 1-454; instinctive behaviour, 1-152; migration, 2-204 illus. f.

Star of Africa. Diamond in Brit. crown jewels, 2-83, 2-536.

Star of Bethlehem. A genus of plants of the lily family, native of Europe, named from their star-shaped flowers; the hardy common star of Bethlehem (*Ornithogalum umbellatum*) has racemes of from 6 to 9 white fragrant flowers which close late in the afternoon.

Star of India. Order of the, 5-530, 4-418.

Stars and Stripes. Popular name for nat. flag of U.S.A., also called "Old Glory," 2-385 illus. f.

Star Shells. in artillery, 1-260.

Star-spangled Banner. The. Amer. national anthem, 5-326, 5-143.

Starter Switch. in motor vehicle, 5-279.

Start Point. Promontory on s. Devon coast, 8 m. s. of Dartmouth; light-house visible for 20 m.

State. A political community organized under a gov't recognized by the people; a state may be independent, subject to other states or a unit in a federation (e.g. U.S.A.).

Staten Island (New York). See Righmond.

States-General. in France. See Estates-General.

Static Electricity. See Electrostatics.

Stationary Office. Her Majesty's. Official gov't. publishers, with h.q. at Atlantic House, Holborn Viaduct, London.

Statistics. in mathematics, 6-148; ciphers in, 2-240.

Stator. of dynamo, 2-143 with illus.

Staubach (stahow'bakh), Waterfall in Switzerland, s. of Lauterbrunnen; height 980 ft.

Staunton, Howard (1810-74). Brit. chess champion and Shakespearean scholar. Wrote many standard works on chess, 2-398.

Stavanger. Spt. on s.w. coast of

STAVROPOL

Norway; pop. 60,000; textiles, soap, procured, iron, fisheries; 5-462.

Stavropol. See Voroshilovsk.

Staysail. See Nautical Terms (list).

Steam. 7-152; boilers, 1-501, 7-376;

and volcanic eruptions, 7-401.

Steam Boiler, and safety valve, 7-376,

1-544.

Steam Carriage, designed by William

Murdoch, 5-296, 297 illus.

Steam Distillation, of oils, 3-94.

Steam Engine, 7-152, 153 illus.; con-

densers, 2-179; governor in, and

centrifugal force, 2-293; compared

with internal-combustion engine,

4-273; locomotive, 5-1; for model

airplane, 1-32; Newcomen's,

7-162; steam road vehicles, 6-112;

steam ships, 7-28; steam turbine,

3-217; Stephenson, 7-155, 5-1,

1-501; Trevithick's, 7-316; James

Watt and, 4-260, 7-131; and weav-

ing, 7-435.

Steam-heating, 4-159.

Steaming, In cookery, 2-498.

Steam Omnibus, 6-112 illus.

Steamships, 7-28 illus., 7-29; Fulton's

first steamboat, 3-188.

Steam Turbines, 7-329, 330, 331; and

production of electricity, 3-217.

Steel; armour-plate and composition

of meteorites, 5-181; Bessemer

process, 1-137, 188; charcoal in

mfr., 2-305; cobalt in steel tools,

2-131; damascene steel, 4-293;

ingot being hot-rolled, 4-292 illus.;

sheffield steel, 7-23; steel-frame

buildings, 1-111, 1-112, 1-117;

steel-works, 4-291 illus.; and zir-

conium, 7-323. See also Iron and

Steel.

Steele, Sir Richard (1672-1729). Irish

essayist and politician, 7-154; and

Adelphi, 1-10; discursive essay,

3-287.

Steelyard. Headquarters in London of

Hansa merchants from 1250-1597,

near present Cannon St. Station.

Steelyar. Type of simple weighing

machine; hence also the district of

London where weighing took place

(see above).

Steen, Jan (c. 1620-79). Dutch

painter, 5-381.

Steenkerke (stänkerke), Belgium, VII,

20 is. s.w. of Brussels where Dutch

and English under William III of

Orléans were defeated by Fr. (1692).

Steepchasing, horse racing, 4-190.

Steer, Philip Wilson (1860-1912). Brit.

landscape painter; influence of

Constable and Turner, 3-263; and

Impressionism, 4-237; Richmond

Castle, 3-271 illus.

Steering Column, in motor vehicle

5-277 with diag.

Stefansson (stäfansson), Vilhjalmur

(b. 1879). Arctic explorer, b. Canada;

on 2nd expedition (1908-12) dis-

covered "blind" Eskimos who had

never seen a white man; in 1913-18

discovered several isls.; revolution-

ized Arctic research by living with-

out supplies, killing seal and deer

for food, 1-221.

Stegosaurius, prehistoric animal, 6-281.

Stein (shün), Heinrich Friedrich Karl,

Baron von (1757-1831). Prussian

statesman; abolished serfdom, re-

formed army, and laid foundation of

Prussia's power.

Stein, Sir (Mark) Aurel (1862-1913). Asi-

atic explorer. After researches in

olden archaeology, began in 1906

famous series of explorations in

central Asia, results of which he

published in numerous books.

Steinbock, John E. (b. 1902). Amer.

novelist and playwright. *Tortilla*

Flat of Mice and Men. *The Grapes*

of Wrath. *The Moon is Down*; 7-366.

Steinhil, R. A. (1801-70). Ger. phys-icist;

discovered principle of "earth

return" in electricity.

Steinitz, Wilhelm (1837-1900). (Ger.

chess champion, 2-325.

Stelae. Carved stone pillars left by some

ancient peoples. Mostly found in

tombes; Mayas, 1-331.

"Stellite." Alloy of cobalt, chromium

and tungsten; properties, 1-116.

Stelvio Pass. Alpine pass in Italy, on

the great highway from Milan to

Innsbruck; it carries the highest

road in Europe for vehicles.

Stem-bogen. A turn in ski-ing, 7-62.

Stem-Christiania. A turn in ski-ing,

7-62.

Sten Carbine. Light automatic firearm,

3-360 with illus.

Stendahl (stän-dahl). Pen-name of

Marie Henri Boyle (1783-1842), Fr.

writer and critic; novels, *Le Rouge*

et Le Noir and *La Chantreuse de*

Parma, had tremendous influence on

development of Fr. novel; 5-172,

3-156.

Stentor. In the *Iliad*, Gk. herald whose

voice was as loud as that of 50 men.

Stephen, St. (577-1038). First king of

Hungary, crowned in 1000; Christian-

ized and civilized kingdom; the

iron "crown of St. Stephen"

was age-long symbol of Hungarian

monarchy, 4-206.

Stephen, St. First Christian martyr;

stoned to death (Acts vi-vii);

painting by Millais, 5-138 illus.

Stephen (b. c. 1097; reigned 1135-54),

king of Eng., 7-154; and Henry II,

4-162.

Stephen, Sir Leslie (1832-1901). Brit.

biographer and essayist; editor of

The Dictionary of National Bio-

graphy; wrote lives of Samuel

Johnson, Pope, Swift, and numerous

essays and sketches on 18th and 19th

cent. literature.

Stephens, James (1882-1950). Irish

poet and short-story writer; subtle

humour and delicate fancy are tied

to a keen appreciation of Irish

character (*Unsurestings*; *The Crock*

of Gold; *Diaries*); 4-287 illus.

Stephenson, George (1781-1818). Brit.

engineer, 7-155; and fire-tube

boiler, 1-501; first successful loco

motive, 5-1; and mechanical brake,

2-42; first public railway, 6-351.

Stephenson, Robert (1803-59). Brit.

engineer, son of George Stephenson,

builder of Britannia tubular bridge

over Menai Strait and Victoria

tubular bridge over St. Lawrence at

Montreal; 7-154, 155.

Stephenson Motion. Type of gear used

in locomotives, 5-3.

Stepney. Bor. of E. London; area 1,786

acres; pop. 98,580; includes White-

chapel, Limehouse, and Mile End,

Tower of London and Royal Mint;

5-27.

Steppes. Vast grassy plains of Europe

and Asia, 1-266, 6-187; in Russia,

6-473; in Siberia, 7-18.

Stereoscope. Optical instrument which

produces illusion of depth in flat

pictures, 7-155 illus.; Brewster and,

2-56.

Stereoscopic Devices, 7-155.

Stereotyping. In printing, the process of

producing type-metal facsimiles of

type and illustrations. A paper-

maché matrix is taken of the

original material, then dried, placed

in a mould wherein molten type-

metal is poured. The completed

plate is approx. $\frac{1}{4}$ in. thick and can

be gnaded flat or, for rotary presses,

curved; 2-5 with illus., 6-290;

5-101 illus., 105.

Sterilisation, and asepsis, 1-177; of

food containers by ultra-violet rays,

7-314.

Sterility in animals, and lack of vita-

min E, 7-101.

Sterling. Term denoting the Brit.

monetary standard, e.g. the pound

sterling, 4-40; sterling area, 3-419.

Stern, Gladys Bronwyn (b. 1890). Brit.

writer; among many novels, *Tents*

of Israel (as a play, *The Matriarch*),

Mosaic, *Oleander River*, *No Son of*

Mine.

Sterne, Laurence (1713-68). Brit.

novelist; *Tristram Shandy* (1759-

67), *A Sentimental Journey* (1768),

5-171, 3-288; portrait, 3-260 illus. f.

Stern Gang. Jewish terrorist organiza-

tion which operated in Middle East

1910-18; co-operated with Axis

powers throughout 2nd World War;

murdered Lord Moyne and Count

Bernadotte; outlawed by Israeli

govt. after formation of state of

Israel.

Sternum. See Breast-bone.

Stethoscope, medical instrument for

listening to heart, lungs, etc., 5-162

Stettin (Poland). See Szczecin.

Steuben Glassware, made in New York

state, U.S.A., 5-421.

Stevens. Mkt. tn. of Herts, 28 m.

N. of London; annual fair held in

main str. in Sept.; pop. 6,627; in

1946 chosen as site of new tn. with

60,000 pop., and first of such sites

to be developed.

Stevens, Alfred (1818-75). Brit. sculp-

tor and painter; worked nearly 20

years at Wellington monument and

tomb in St. Paul's Cathedral; 6-521

Stevens, Alfred (1828-1906). Belgian

painter, whose finished technique

and careful execution greatly in-

fluenced many of his contemporaries;

particularly successful in portraits of

ladies of fashion; 1-122.

Stevenson, Robert (1772-1850). Brit.

engineer, inventor of intermittent

lights for lighthouses; built Bell

Rock and some other lighthouses on

Scot. coast; grandfather of Robert

Louis Stevenson; 4-501.

Stevenson, Robert Louis, 7-156, 6-511,

3-291; verses for children, 2-35;

illus. 356; *Treasure Island*, 2-356.

Stevinus (stēv'us), Simon (1581-1620).

Dutch mathematician; invented

decimal system, 3-59.

Stewards, in Merchant Navy, 5-172.

Stewart. Scottish royal house. Same

as Stuart (q.v.).

Stewart, Dugald (1753-1828). Scot.

philosopher of the "common-sense"

school; popular lecturer at Univ. of

Edinburgh (*Elements of the Philo-*

sophy of the Human Mind; *Outlines*

of Moral Philosophy); 6-160.

Stewart Island. One of the New Zealand

group; area 6

STINKING HELLEBORE

in shady places in woods, shrubberies etc., and distinguished by columnar shape with small pointed spots on it, small attractive flies and these disperse the spores

Stinking Hellebore. See *under* Christmas Rose.

Stinking Iris. See *Gladdon*

Stinkweed. See *Jimson Weed*.

Stin nes, Hugo (1870-1924). Great industrial manager and financier, leading figure in reconstruction after 1918, organized a gigantic interlocking business based on the mining industry and including many subsidiary enterprises

Supendary Magistrate. In Eng and Wales a salaried full time magistrate who, in cities and large towns performs duties of provincial justice of the peace

Stipules. Scale or leaf like appendages at bases of plant leaves

Stirling. Co. in of Stirlingshire Scot pop 26,900

Stirling Bridge. Battle of, between Scots and English (1297) 7 158 7 41

Stirling Castle. Ancient Scottish stronghold 7 157 illus f

Stirling Castle. Union Castle liner 7 39

Stirlingshire. Co. of Scot., area 451 sq. m. pop 187,432 co. in Stirling 7 157

Stitching. on boots and shoes, 2 10

Stitchwort. A plant 7-158

Stoat. Animal of the weasel family, protective coloration, 6 298 with illus f For fur, see *Ermine*

Stock. Popular garden flower of order *Cruciferae*, usually white, red, pink or purple with double flowers several species grow wild (rare) on cliffs in Britain

Stockbreeding. 1 78 In Argentina 1 223

Stockbroking. as career, 2-210

Stock Dove. bird 6-194

Stock Exchange. A place where stocks, shares and negotiable securities are bought and sold London and New York stock exchanges are the most important in the world See also *Stock Exchange Terms*, *Stocks and Shares*

Stockholm. Cap. of Sweden, pop 715,936, 7 158, harbour 7 201 Stadshus, 7 201 illus f, road design 6 107 illus

Stockings. how made, 4 119 120 illus advantages of nylon 5 488

Stockport. Mfg. in of Cheshire and Lancs Eng on t Mersey, in S. of Manchester, pop 111,600 cotton mills, hat factories, foundries, breweries

Stocks. instrument of punishment, 6 291 with illus

Stocks and Shares. 7 158

STOKES

Stookton and Darlington Railway. opening (1925) 6 131 3 139

Stookton-on-Tees. Spt of Durham Eng near mouth of Tees, pop 74,021, large iron and steel works shipyards potteries

Stockyard. Place in which cattle are kept before being slaughtered

Stoddart, Andrew Ernest (1861-1914). Brit sportsman, brilliant Middlesex and England cricketer and international rugby footballer

Stoffels, Hendrikje (d 1662). Rembrandt's second wife 6 384

Stoics. Philosophers teaching indifference to external pleasure and pain and Painted Colonnade (Athens) 1 288

Stoke Newington. Bor. of S. London in S. of St. Pauls, contains

• New River waterworks and reservoirs, pop 19,137, 5 27

Stoke-on-Trent. City in Staffs Eng, made up of the five towns (Tunstall, Burslem, Hanley, Stoke upon Trent and Longton), pop 275,095 7 141 Arnold Bennett and, 1 129 with illus, potteries 6 277

Stoke Poges. Village in Bucks Eng, 20 m W of London, Gray and 4 67 churchyard 3 287 illus

Stokes, Sir George Gabriel (1819-1903). Brit physicist, devoted himself to the mathematical investigations of physical problems and published his researches on the dynamical theory

STOCK-EXCHANGE TERMS IN COMMON USE

Above par. When the price of stocks or shares etc. is higher than that at which they were issued, they are said to be *above par*

Accrued dividend. Dividend accumulated but not paid since the last dividend payment shares are then sold plus accrued dividend, which means that the accrued dividend is added to the price

Accrued interest. Amount accumulated on shares and the evidence of indebtedness since the price includes interest due

Arbitrage. Simultaneous buying of stocks or shares in one market and selling them in another where the rate is more favourable

Average. In stock exchange dealings *averaging* is the act of increasing or decreasing transactions in securities with fluctuations in the market, to secure the desired average price

Backwardation. The charge for postponing settlement of a bull transaction until next settlement day

Bear. One who believes that prices of commodities or securities will go down, he may work to that end either by selling securities he actually owns or by selling short term is supposed to come from the bear's practice of holding down his victim opposite of bull

Below par. When the price of stocks or shares etc. is lower than that at which they were issued, they are said to be *below par*

Bond. A deed whereby a person, company or government agrees to pay a sum of money at fixed time under certain conditions Bonds are either *registered* or *to bearer* Bonds to bearer have coupons attached for presentation when dividend is due

Bonus. Extra dividend paid to share holders when profits are above normal

Books closed. Time when stock transfer books of a business are closed to permit checking of shareholders to whom dividends are due, a company cannot transfer shares from one holder to another while the books are closed

Boom. A period of activity on the stock exchange with demand for all classes of security, causing a general rise in prices A short period of this kind is called a *boomlet*

Broker (stock). One who acts between buyer (or seller) of securities and the jobber, *outside broker* one not member of stock exchange

Bucket Shop. The office of an unscrupulous outside broker is called a bucket shop

Bull. One who buys commodities or securities in expectation that they will advance in price term is supposed to come from the bull's method of attack which is to toss upward on his horns the opposite of bear

Carrying charges. Interest charged by brokers for money advanced to carry accounts of their customers for whom they have bought securities on margin (transactions by means of these loans is called *buying on margin*)

Consols. Abbreviation of *Consolidated Funds* the stock of British funded National Debt

Contango. Interest charged by jobbers for carrying over a bull transaction to the next settlement

Corner. The condition of the market when the available supply of a commodity or a security has been concentrated a corner is the ultimate result of bullish operations

Cum-div. With the accrued dividend **Cumulative shares.** On these any dividend not paid one year is carried forward to the next as a liability

Debenture. Secured bond issued by a company acknowledging it has borrowed a certain sum on which interest is payable A debenture holder is a *creditor*, not a shareholder his claims must be satisfied before any dividend is paid

Deferred stock. or *bonds* Interest on these is payable only after the preferred stock has received its share

Ex dividend. Meaning without dividend Dividends are declared due to recorded share holders on a specified date Between the record date and the date on which the dividend is payable, the stock is sold *ex dividend* the dividend accruing to the seller and not to the buyer

Firm. The term used in grain and stock exchange, to describe binding options granted by a seller to a prospective buyer, when a security is offered *firm*, the seller obligates himself to deliver the amount specified at the agreed price

Futures. Securities or commodities sold or bought with the assumption of delivery at a later date

Jobber. A stock dealer who is a member of the Stock Exchange and deals with the public only through the medium of brokers

Joint stock company. An association whose funds or capital are divided into shares

Limited liability company. A partnership whose liability is limited to the stated capital distinguished from the ordinary partnership where all the property of the partners may be seized for the debts of the partnership usually indicated by the abbreviation Ltd

Ordinary shares. Shares on which dividend is paid only after a debenture interest and preference dividend

Par. Face value or the value at which stocks or shares were issued

Preference shares. or *preferred stocks* Shares bearing a stated fixed dividend which must be paid out of earnings before ordinary or common dividends are declared ordinarily they are non-voting shares

Prospectus. Document giving certain prescribed particulars of a new company

Rights. The privilege to subscribe usually to stocks and bonds at a price which makes the privilege valuable

Settlement. On Stock Exchange Settlement Day or Pay Day 1st day for payment of an account or claim

Shareholder of stockholder. One who owns shares in a corporation or limited liability company A shareholder is liable only to the extent of unpaid shares

Short selling. A sale made in anticipation of a decline in price by a seller who does not own the securities or commodities sold the broker who executes the sale borrows securities or commodities from another customer or broker and makes delivery to the buyer when the seller buys in to take his profit or loss he is covering his short position

Speculation. Trade in securities or other commodities in order to make a profit distinguished from investment which is purchased to obtain income

Stag. Speculator in first issues of shares of a company, who applies for allotments intending to sell them immediately the shares are quoted at a higher price on the Exchange

Ticker. The tape machines on which stock exchange transactions are recorded are known as *tickers* At periods of great activity the machines are unable to record all transactions immediately, and the *ticker* is said to be *ten minutes*, or two hours, etc *behind the market* The lagging of the ticker is a sign of a *boom*

STOKESAY CASTLE

of diffraction; one of his discoveries is known in science as Stokes's law. **Stokesay Castle**, Shropshire, Eng. 7-45, 2-259.

Stoke-upon-Trent. One of the "Five Towns" of Stoke-upon-Trent, 7-141.

Stoking, Mechanical, 1-505 with illus.

Stokowski, Leopold (Antoni Stanislaw Holszawski) (b. 1882). Amer. conductor; b. in London of Polish parents; conductor of Cincinnati Orch. 1909-12; of Philadelphia Symphony Orch. 1913-36. Made film *Fantasia* with Walt Disney in 1941.

Stomach, in cattle, 2-273; in human digestive system, 2-29, 90; 1-144; the milking room, 6-191 illus.

Stomata. Pores on the surface of a leaf, 4-469, 2-25 illus.; in water-plants, 7-430.

Stons. A unit of weight. *See* Weights and Measures (list).

Stone Age, 7-181; life of Stone Age people, 2-282; spread of culture by migration, 5-203; bread, 2-50; burial chamber, 7-189 illus.; tools and weapons, 1-205.

Stonechat. A small European bird (*Pratincola rubicola*), so named from its clicking note; its plumage is black above and dark reddish underneath, 7-448.

Stonecrop. Plant; leaves, 4-470.

Stone Cypress, 2-535.

Stone Curlew. Migration, 5-204 illus. 1.

Stonehaven. Co. tn. of Kincardineshire, Scot.; pop. 4,438; 4-404.

Stonehenge. Prehistoric stone monument on Salisbury Plain, 7-163, 164, 5-109.

Stone Marten. Animal of the weasel family, 5-138.

Stone Pine. Species of pine tree, 6-204.

Stone River, Tennessee, U.S.A. Tributary of Cumberland r., which enters 5 m. above Nashville; gives name to a Federal victory over the Confederates in the Civil War (1863).

Stones, Precious, 7-164, 165 illus.; gem minerals, 5-214. *See also* Jewelry.

Stones of Venice, The (1851-53). Book by Ruskin expounding his theories of the relation of architecture to all other human activities, 6-471.

Stony Coral, 6-129 illus. 1.

Stool-Ball. Game, 2-528.

Stop. *See* Architectural Terms.

Stopes. Working places in a metal mine, 6-218.

Stops, of organ, 6-1.

Storage Battery, in motor vehicle, 6-279.

Storax. Variety of balsam, in perfume, 6-124.

Stories and Legends: Aladdin and his Wonderful Lamp, 1-197; Alice in Wonderland, 2-252; Blackface Meets his Neighbours, 6-329; Blackie and Ginger, 1-397; The Blue Bird, 5-73; Circe and Odysseus, 2-402; The Clerk's Tale of Patient Griselda, 2-313; The Constant Tin Soldier, 1-145; Cupid and Psyche, 3-11; Don Quixote, 2-295; The Legend of the Golden Bough, 3-461; Gulliver's Travels, 7-205; How Golden Wings Learned to Fly, 7-469; How Screecher Learned to Hunt, 6-13; How The Wooden Horse Came to Troy, 7-320; How Horatius Kept the Bridge, 6-59; The Labours of Hercules, 4-165; The Story of Hiawatha, 5-35; Legend of the Kingfisher, 4-405; The Knight's Tale of Palamon and Arcite, 2-312; Lohengrin, 5-18; Midas, 5-198; Song of the Nibelungs, 5-439; Noah and the Ark, 5-445; Nursery rhymes, 5-476; Odin, 5-500; Adventures of Odysseus, 5-501; Oedipus, 5-505; Orpheus and his Lute, 6-4; Paradise Lost, 5-211; Perseus, 6-158; Peter Pan, 1-373; Pilgrim's Progress, 2-126; Pinocchio, 5-501; Like the Quills, 6-261; concerning the Rhine, 6-391; Rip Van Winkle, 4-297; Robin Hood and His Merry Men, 6-417; Robinson Crusoe, 3-2; Tales of the Round Table Knights, 6-467; Samson, 6-495; Scott's Last Venture, 6-515; The Tadpole

who wanted to be a Frog, 2-273; The Three Spiky Vintners, 4-188; Tom and his Friend, the Lobster, 4-409; Twenty Thousand Leagues Under the Sea, 7-393; What Sinbad Found out in the Desert, 2-155; White Tail and the Old Stag's Lesson, 5-81; Why the Tortoise Bites So Hard, 7-297. *See also* Children's Books.

Storks, 7-166, 167, 169 illus.; adjutant bird, 1-90; foot, 1-471 illus.

Stork's-bill. Plant of genus *Erodium*, and a close relative of the crane-bills, family *Geraniaceae*. Several Brit. species, with pinkish flowers, pinnate leaves and beak-like fruits.

Storm, Theodor (1817-88). Ger. novelist and poet, master of the short story, 4-14.

Stormcock. Another name for mistle-thrush, 7-271.

Stormont, Belfast, N. Ireland; Parliament buildings at, 1-417.

Storm Petrel. Sea-bird, 6-147, 146 illus.; used as lamp in Shetland Is., 4-443.

Storms, 7-169.

Storm Troops. Armed and uniformed members of the former Ger. Nazi party, formation by Hitler, 4-182.

Stornoway. Chief port of Lewis-with-Harris, Hebrides, Scot., 6-455; fish quay, 2-381 illus.; seaweed processing factory, 4-152.

Storrs, Sir Ronald (b. 1881). Brit. administrator and expert on Eastern affairs; and T. G. Lawrence, 1-195.

Storting. Norwegian parliament, 5-467.

Stour (stör), name of several small Eng. rs.; in Dorset and Hants, 3-107; in Suffolk, 7-183; in Essex, 3-298.

Stovaine, an anaesthetic; spinal injection, 1-143.

Stove, Franklin's iron stove, 4-149.

Stow, John (c. 1525-1605). Eng. chronicler and antiquary; was a tailor till a few years before his death (*Summaries of English Chronicles; Annals of England; Survey of London*).

Stowe, Harriet Elizabeth Beecher (1811-98). Amer. novelist, author of *Uncle Tom's Cabin*, 7-66, 7-364.

Stowe. Mansion in Bucks, Eng. now a boys' public school; Capability Brown's work at, 2-94.

Strabo (sträbō) (c. 63 B.C.-A.D. 19). Gk. geographer and historian; wrote first general treatise on geography, 4-94.

Strachey (strä'chi), (Giles) Lytton (1880-1932). Brit. essayist and biographer (*English Victorians; Queen Victoria; Books and Characters; Ellen-beth and Essex*); 1-446, 3-291.

Stradivari or *Stradivarius* (stradivä'rius), Antonio (1644-1737). It. (Cremona) violin-maker, greatest that ever lived, 7-403.

Stratford, Thomas Wentworth, Earl of (1593-1641). Eng. statesman, strong believer in absolute royal power; advised Charles I to resist Parliament; executed for treason by Long Parliament, 7-170, 2-307, 4-453 illus.

Straight, The Street called, Damascus, 3-34.

Straits Settlements. Former Brit. crown colony in Malay Peninsula, now part of the Federation of Malaya.

Stralsund (strahl'zund). Ger. Baltic port; pop. 38,000; important member of Hanse League; Wallenstein's siege in Thirty Years War.

Strand. Business thoroughfare in London, extending between Charing Cross and Temple Bar; formerly led from City to Westminster along marshy left bank of Thames, hence the name.

Strasbourg (strahsboor). (Ger. *Strassburg*). Fr. city in Alsace; pop. 175,500; 1-127, 3-434, 4-12.

Strasbourg, Oaths of, 2-463.

Strata, in geology, 1-254.

Stratford-upon-Avon. Tn. in Warwickshire, Eng.; pop. 14,980; 7-171; Shakespeare and, 7-12, 14 illus.

Strathclyde. Anc. Brit. kingdom extending from Clyde to Derwent r.; stronghold of original Celt inhabit-

STRIKES

ants against Anglo-Saxons (7th-11th cents.).

Strathcona and Mount Royal, Donald Alexander Smith, Baron (1830-1916). Scot.-born Canadian politician; became gov. of Hudson's Bay Co.; helped settle the Red River rebellion of 1869. Formed a syndicate to build the Canadian Pacific Rly.; and Grenfell, 4-96.

Strathmore, Vale of. Fertile valley of Scot., 1-151.

Strathpeffer. Tn. in Ross and Cromarty, Scot., 6-456.

Strato-cumulus, clouds 2-423, 422 illus.

Stratosphere. Layer of the atmosphere above the troposphere, (earth's atmosphere) 7-171, 1-81, 7-172 illus.; weather in, 5-180; and winds, 7-459.

Stratton, Charles (1837-83). Amer. dwarf popularly known as General Tom Thumb, 2-441.

Stratus, clouds, 2-421.

Strauss, Johann (1825-99). Ger. composer, 7-172; *Die Fledermaus*, 5-516.

Strauss, Richard (1864-1949). Ger. composer, 7-172, 173 illus.; influence on orchestra, 5-528; symphonic poems, 5-505; *Der Rosenkavalier*, 5-520.

Stravinsky, Igor (b. 1882). Russ. composer, noted for music for ballets *L'Oiseau de Feu; Petrouchka; Le Sacre du Printemps*; opera, *The Rake's Progress*; 6-306.

Strawberry. A fruit, 7-173; fruit and blossom, 3-484 illus.; arbutus "strawberries," 1-201 with illus.

Strawberry-headed Trefoil. *See under* Trefoil.

"Strawberry" Tree *Arbutus unedo*, 1-201.

Streamlining, 7-173; of ships, 7-41.

Streathfield, Noel. Brit. woman writer of children's stories; *Ballet Shoes; The Circus is Coming*; 2-356.

Streicher, Julius (1885-1946). Ger. Nazi politician; in 1924 started a Jew-baiting weekly paper (*Der Stürmer*) which brought him huge fortune; Gauleiter of Franconia under Hitler; hanged as war criminal in 1946 after trial at Nuremberg.

Streit'el or Strelitz. Household troops of the Tsars, instituted by Ivan the Terrible; backbone of Rus. army in 16th and 17th cents.; frequent mutinies led to abolition by Peter I.

Streptiptera. Order of insects, 4-370.

Streptococcus. A micro-organism which occurs in many varieties and poisons the body system; infection by, 4-15, 1-344.

Streptomycin. Drug derived from the fungus *Streptomyces griseus*; used in treatment of tuberculosis and other infections; 1-175.

Stresa (strä'sa). It. vil. and Alpine resort on Lake Maggiore; scene of Three Power Conference in 1935.

Stresemann (strä'zemahn), Gustav (1878-1929). Ger. statesman, entered Reichstag 1906; became leader of National Liberal party; after 1st World War became head of German people's party; chancellor and foreign minister (1923) awarded Nobel peace prize in 1926; one of the authors of the Locarno pact; 4-9, 10, 4-464.

Stress, in bridge construction, 2-61 with diag.

Stretcher. *See* Architectural Terms.

Strigidae. Family of birds including the owls, 6-11.

"Strikes", in handmoulding of bricks 2-58.

Striker. In baseball, 1-377.

Strikes. Cessation of labour by employees to enforce their demands upon their employer, or to protest against his actions; sympathetic strike is one called by workers with out a grievance on behalf of striker in another field; general strike one carried out in all fields of labour simultaneously; "unofficial" strike is one called against the advice of trade union officials; General Strike (1926), 2-386.

AN ABC OF PRECIOUS STONES

Agate. A type of chalcedony or semi-precious quartz, with coloured bands, first found on banks of river Acheates (Sicily), hence the name. The markings of moss agates occasionally resemble natural objects, and so were much prized in the past. Most agates are naturally greyish and are artificially coloured.

Amethyst. A quartz found in Brazil, Ceylon, and Siberia. Heat turns it yellow. Worn by ancients to prevent intoxication; many wine-glasses were made of it in ancient Rome. Was formerly ten times as valuable as to-day.

Aquamarine. A sea-blue or sea-green beryl, of the same class as the emerald, but far less valuable.

Aventurine. A quartz spangled with yellow mica or other mineral. Also called goldstone.

Azurite. An azure-blue copper carbonate found in most copper mines, usually directly above a layer of green malachite. Pliny calls it caeruleum. Value not great.

Beryl. A silicate of low value, though related to the emerald. May be green, light blue, yellow, pink, or white.

Bloodstone. A quartz, dark green with blood-red spots, prized in Middle Ages for cures of martyrs. Also called heliotrope. Found in Persia, Siberia, Colorado, U.S.A.

Calngorm. Black or smoky yellow quartz, changed by heating to dark brown or yellow. National stone of Scotland; also called Scottish topaz. Often nearly opaque.

Carbuncle. A garnet cut *en cabochon*, that is, flat on the bottom, rounded above, without facets. In ancient times any red stone was called a carbuncle, and a mythical carbuncle "was said to give out light in darkness."

Carnelian. Name given to brown and red chalcedony. Much used for engraved seals in ancient times.

Cat's-eye. The cheaper cat's-eye is of quartz, the more highly valued is of chrysoberyl. Colours range from apple-green to olive, from yellow to brown, but each has a streak or line of varying brilliance, through the middle, like a cat's eye. Hindus value the stone second to the diamond.

Chalcedony. A crypto-crystalline quartz, used by gem engravers in all ages. Called onyx, sardonyx, sard, and carnelian, according to staining.

Chrysoberyl. A rare, unusually hard stone. One variety, the alexandrite, green by day and red by lamplight, had a great vogue among Russian aristocrats.

Chrysolite. An olive-green vitreous magnesium iron silicate; also called olivine and peridot. It is crystalline and, when transparent, used as gem.

Chrysoprase. An apple-green type of chalcedony, found in U.S.A. and Polish Silesia.

Cymophane. Same as cat's-eye.

Diamond. Pure crystallised carbon; hardest known substance, is fairly brittle and easily split, contrary to popular belief that a diamond may be pounded with a hammer and will not break. World's largest and richest deposits are in the Union of South Africa.

Emerald. When large, brilliant, and flawless, the emerald is the costliest of gems. Composed of silicate of aluminium and beryllium. Chief source of deep green emeralds is Colombia. Some of the most beautiful from North Carolina, U.S.A.

Garnet. A deep red stone, of two varieties, almandine or almandite, and pyrope or Bohemian garnet. When cut *en cabochon*, both are called carbuncles. The Bobrovka, or green garnet, resembles emerald, but is not hard. Olivine is erroneously called green garnet. Hyacinths are garnets.

Heliotrope. Same as bloodstone.

Jade. A name applied to jadeite, nephrite, and chloromelanite. Jewelry, cups, altar-pieces, and bells or sounding stones are made of it, and poems of emperors have been carved in priceless jade bowls. It does not occur naturally in China, but is imported from Burma. It is also found in Siberia, New Zealand, Mexico, and Europe.

Jasper. An opaque quartz, a variety of chalcedony, putty colour, red, or yellow, mined in Egypt and Russia; much used in Russia for vases, tables, mantels, etc.

Jet. A hard black lignite, or variety of fossil coal, mined in Great Britain, China, and elsewhere. Light in weight.

Lapis Lazuli. Sodium aluminium silicate with sodium sulphide; usually deep blue. Mines in Afghanistan, worked for 6,000 years, probably world's oldest mines. Called "sapphire" by ancient world. Finest varieties are gold-flecked with iron pyrites. Cracked quartz stained blue is sold as "Swiss lapis."

Malachite. Colours range from dark to grass-green, streaky, much used in Russia. Slabs occur large enough for table tops.

Marcasite. Metallic stone ranging from slate-grey to bronze-yellow, same composition as pyrites, often set as brilliants in costume jewelry.

Moonstone. A variety of translucent feldspar; has a moon-like flash; best specimens found in Ceylon.

Obsidian. A smoky natural glass of volcanic formation, abundant in Yellowstone Park, U.S.A. Used by early Mexicans and North American Indians to make mirrors, arrow-heads, and knives.

Olivine. Same as peridot and chrysolite, differing only in colour.

Onyx. The cameo carver's favourite material. Quartz, or chalcedony, with horizontal stripes of black and white, found in South America and Indian sub-continent.

Opal. Harlequin opals have flashes of colour throughout; fire opals are yellow or red with a shifting glow; black opals are dark with coloured lights. Occur in Hungary, Australia, Mexico, and U.S.A. World's largest opal, size of half a buck, black with green and blue fire, found in Nevada. Reputation for ill luck may be due to fragility of stone and occasional loss of brilliance.

Pearl. Not truly a precious stone but the product of pearl oysters.

Peridot. Same as olivine and chrysolite.

Rhodonite. A red or rose stone, streaked with black, of manganese and silica; much prized in Russia.

Rock crystal. A quartz much used for beads, vases, goblets, and crystal balls.

Ruby. A transparent red corundum valued according to shade of colour. Best grade found in Burma, others in Siam, Ceylon, U.S.A. Most valuable shade is "pigeon's blood." Fine rubies of 4 or more carats are worth from 2 to 5 times as much as diamonds of same size. Seldom weigh more than 8 or 10 carats.

Sapphire. A transparent corundum, or aluminium oxide, found mainly in Burma, Ceylon, Siam, and Kashmir; lesser quantities in Australia and U.S.A. Best shades "cornflower" and "velvet" blues. Largest known weighs 910 carats.

Sardonyx. A variety of chalcedony with brown and white stripes, or layers of chalcedony and carnelian.

Spinel. Composed of magnesium and aluminium. Clear spinels are valuable; red ones called "spinel rubies."

Topaz. Scots topaz is yellow quartz. Oriental is yellow sapphire. Brazilian is true topaz. When heated, yellow topaz turns pink. "World's largest diamond," among Portuguese crown jewels, may be the colourless topaz. Topaz may be blue, green, brown, pink, white, or yellow.

Tourmaline. A silicate, either black, brown, blue, green, red, or colourless, various colours having different names. Found in Brazil, Siberia, and U.S.A.

Turquoise. An aluminium phosphate, from sky-blue to apple-green. Best grade from Persia, where it has been mined for 800 years. Also found in U.S.A. Heat and sunlight fade turquoise or turn it green. Turquoise matrix is mottled with natural rock.

Zircon. The mineral form of zirconium silicate. It is found in Ceylon, Australia, Europe, and South America. Natural colours are blue, brown, and green, but are frequently heat-treated to secure greater brilliancy, and colours have been known to fade. Closely related to the hyacinth (red), jacinth (yellow), and jargon (white), differing only in colour.

STRIKING

Striking, of clocks; mechanism, 2-416.
Strindberg, Johan August (1849-1912). Swedish author. Wrote bitterly satirical plays (notably *The Father*) and short stories (e.g. *Marrido*) as well as novels depicting Swedish life (*The People of Hemsö*; *At the Edge of the Sea*).
String, Twine, and Thread, 7 173.
Stringed Instruments, types of, 5 307.
Stringfellow, John (1799-1883). Brit. inventor of first model powered aeroplane to fly, in 1848; 1 32, 29 illus.
String Orchestra, development, 5 527.
String Quartet. A musical combination, consisting of two violins, viola, and cello, 7 402.
Striped Hyena, 4 223.
Strip System (farming). See *Open Field*.
Strobila. Stage of growth in life of jelly fish, 4-361 illus. f.
Stroboscopic Effect. In cinematograph pictures of moving wheels the spokes sometimes appear to revolve slowly the wrong way if the pictures were taken at the rate of 30 per second, and during the thirtieth of a second each spoke has moved into the position occupied by the previous one, they appear to be at rest. If they have not moved quite so far they appear to be slipping backwards.
Stroheim, Erich von (b. 1875). Amer. film director and actor, 2 401.
Stromboli [strom'boli], Mt. Active volcano 3,000 ft. high on Stromboli, one of Lipari Is., Italy.
Stromness. Tn. on Mainland, Orkney Is., Scot., pop. 1,503; 6 1.
Strongbow. Nickname of Richard de Clare, Earl of Pembroke (d. 1176). Began Eng. conquest of Ireland.
Strongrooms, doors, 6-181.
Strontium (Sr). Chem. element; atomic no. 38, atomic weight 87.63; melts at 800° C.; 3 224, 1 112.
Stroud. Market tn. of Gloucestershire, Eng., pop. 15,977. Has cloth mills, sawmills, breweries, non-ferrous, makes plastics; noted for set, let dyes; 4 31.
Strozzi [stro'tsi]. Palace, Florence, 14th cent., walled to state (1907).
Strube, Sidney (1891-1956). Brit. cartoonist; on *Daily Express* 1912-48; creator of the "Little Man."
Structural formula. In chemistry, 1-11.
Strut. See *Architectural Terms*.
Strutt, Jedediah (1726-97). Brit. inventor of ribbed hose machine, c. 1755; partner of Arkwright in cotton mills; ancestor of Lord Rayleigh; 4 119, 1 210.
Strychnine [stri'kni:n]. A poisonous drug; in small quantities it is used in medicine, 6 236.
Strychnos nux-vomica. A tree yielding porous strychnine and brucine.
Strzydom, Johannes Gerhardus (b. 1893). S. African statesman. Formerly ostrich-farmer, civil servant, lawyer; political life since 1931; succeeded D. F. Malan as prime minister 1954.
Strzeczki, Sir Paul de (1796-1875). Anglo-Polish explorer, discovered Mt. Kosciuszko, Australia, 1 316.
Stuart. Royal family in Scots and Eng., 7 173; related to Wittelsbachs, 1-348.
Stuart, Lady Arabella (1575-1615). Cousin of James I.; centre of Eng. political intrigue because a possible heir to throne; imprisoned for life after making forbidden marriage.
Stuart, Charles Edward (1720-48). The Young Pretender. See *Charles Edward*.
Stuart, James Francis Edward (1688-1766). The Old Pretender. See *James* (the Old Pretender).
Stuart, Jesse (b. 1907). American poet, 7 366.
Stuart Highway. Road in Australia, 621 m. long, 1-320.
Stubbs, George (1724-1806). Brit. painter of sporting scenes; much of his work is in National Gallery and Victoria and Albert Museum. Published (1766), famous work *The Anatomy of the Horse*, with plates drawn and engraved by himself; 3-273.

Stud. See *Architectural Terms*.
Sturdee, Sir Frederick Charles Doveton (1859-1925). Brit. admiral who sank Ger. squadron in battle of the Falkland Is., Dec. 8, 1914, and commanded a battle squadron at Jutland; promoted Admiral of the Fleet (1921).
Surgeon, William (1783-1850). Brit. physicist; inventor of electro-magnet, 5 85, 2-215.
Surgeon. A large fish; in Gt. Brit. any caught in territorial waters belong to the sovereign; 7 174.
Sturm und Drang (Storm and Stress). Ger. literary movement of 18th cent.; a revolt against over-formal classical writing; Goethe and his aims, 4 38.
Stuttgart. City of W. Germany, cap. of the Land of Baden-Württemberg on R. Neckar. Mfrs. include motor vehicles, electrical, chemical and optical instruments; pop. 181,850.
Style. Stem which supports the stigma of a flower, 3 390, 398 illus.
Styles, James (d. 1951). Brit. showman; and his falls, 3 337.
Stylographic Pen, 6 112.
Stylus. Pointed writing instrument used by ancient; Babylonian 1 335 illus., Roman, 6-111 and illus.
Stymie, in golf, 4 11.
Stymphalian Birds. In Gk. myth., monsters slain by Hercules, 4 166.
Styria [stir'i:al]. Mountainous dist. in S.E. Austria and N.W. Yugoslavia; formerly Austrian crown-land; area 8,600 sq. m.; forests, minerals.
Styx [stiks], in Gk. myth., r. of the underworld, over which dead were ferried; legend of Achilles, 1-10.
Suakin [soo'n'kini]. Port in the Sudan, on Red Sea; pop. 8,000; partly built upon a coral islet and partly on the mainland.
Sub-atomic particles, 1-298; acceleration by cyclotron, 3 17.
Subconsciousness. Term used by psychologists for a state of mental activity unaccompanied by consciousness, e.g. in dreams.
Sub-editor, on a newspaper; 5 403.
Sub-imago. Stage in the life of a mayfly, 5 150.
Subjects in grammar, 4 55.
Sub-Lieutenant, in Royal Navy; insignia, 5 351 illus.
Sublimation, in neurosis, 3 170.
Sublimed Sulphur (flowers of sulphur), 7 187.
Sublime Porte. The Old name for Turkish govt., before republican days; from high gate of building containing state dept. offices.
Submarine, 7 174, 175, 176, 5 312, 319; diesel engine in, 3 89; periscope, 6-127 illus.; detected by television, 7 254 illus.; *Thermopiles*, 5 356 illus.; torpedo tubes in, 7 293, 292 illus.; in 1st World War, 7 483, 482; U-boats in Battle of Atlantic, 1939-45, 1 293, 7-487 8.
Submarine Cable. See *Cable*.
Sub-order in biological classification, 1 152.
Subotica [soob'otika], or *Maria-Theresopol*, city of Yugoslavia; pop. 100,000; agric. and mfg. centre.
Sub-phylum, in biology, 1 432.
Subpoena [sup'na] (Latin, "under penalty"). A judicial writ requiring a person to appear at a certain time and place; commonly used to compel attendance of witnesses at court trials; penalty imposed for failure to comply.
Subtraction, 7-177, 3-58.
Succession, in Brit. royal family, 6-403.
Succession, Act of (1701), in Eng. history, a law providing that the crown should pass, after Queen Anne's death without heirs, to the nearest Protestant branch of the Stuart family.
Suckling, Sir John (1609-42). Eng. "cavalier poet" whose gay, charming lyrics are full of oft-quoted lines, especially the "Ballade upon a Wedding"; 3-285.

SUIR

Suere. Nominal cap. of Bolivia; pop. 30,000; on high Andean plateau in s.-cent. part; formerly called Ciudad de la Plata, it was renamed Sucre upon declaration of independence (1825); 1-507.
Suere. See *Money* (flat).
Suercro. Cane or beet sugar; it differs from fructose and maltose in structure of molecule, 7-186, 6-182.
Sudan. A vast region in N. Africa, 7-179; and Egypt, 3-176; irrigation, 7-180; Khartoum, 4-402; source for slave markets, 7-66.
Sudan, Republic of the. Independent African country, formerly Anglo-Egyptian Sudan; area 967,500 sq. m.; pop. 8,764,048; 7-179, 1-53, 3-180.
Sudan, French. French overseas territory, W. Africa; area 479,783 sq. m.; pop. 3,406,600.
Sudan Grass. A hay grass of value in semi-arid regions; it has no perennial root-stock; it is treated as an annual, but it becomes a perennial in frostless regions; in the island of Hawaii it has been found the most valuable grass ever introduced.
Sudbury, Ontario. Tn. 30 m. N. of Georgian Bay; pop. 42,410; smelters, planing mills, machine shops, large electro-slag plant, govt. school of mines, Jesuit College; nickel deposits, 5-133 illus.
Sudd. Floating weed, etc., choking channel of upper Nile.
Sudeten Germans. Germans inhabiting the Sudeten mt. region of Czechoslovakia who in 1938-39 demanded full autonomy; the Munich agreement gave the area to Germany. In 1945 the Czechs expelled the Sudeten Germans into S. Germany.
Sudetenland. Territory of Czechoslovakia (Bohemia), named from Sudeten mts., Czech German dispute, 3 22, 4-1, 7 186.
Sudras. Hindu labouring caste, 4 178, 1 262.
Sue, Eugène (1801-57). Fr. novelist popular and sensational (*The Hunchback of Notre-Dame*; *The Mysteries of Paris*).
Suede Leather, mtr. of, 4 168.
Suetonius Paulinus (1st cent. A.D.). Rom. gov. of Brit.; and Boadicea 1 196; defeat of Druids, 3 127.
Suetonius Tranquillus, Caius (c. 100-160). Rom. historian, 4 141.
Suez. Egypt. port on Red Sea at S. end of Suez Canal; street scene, 3 176 illus.
Suez Canal. Waterway connecting Mediterranean and Red Sea, 103 m. long, 7 180, 181, illus., 3 179; 19-mch and, 3 93; importance to Brit., 5 166, 3 176; swing bridge, 1-49; nationalisation, 7 182.
Suffolk. Co. of Eng. on E. coast; area 1,482 sq. m.; pop. 512,439; co. in Ipswich; 7 182.
Suffolk Down sheep, 7-22.
Suffolk Ham, curing of, 1 312.
Suffrage. See *Ballot*; *Election*; *Vote*; *Women's Suffrage*.
Suffragette. See *Women's Suffrage*.
Sugar, 7 183; in alcohol, 1 96; from sugar beet, 1 410, 411 illus., 1 sugar cane, 7 100 illus., 7-185 illus., in diet, 3-410, 411 diag.; fermentation produced by yeast, 7-512 made by green plants, 6-182 growth of industry, 1-410, 411 from maple syrup, 5-117; and polarised light, 4-501; starch a form of, 7-149. †
Sugar-cane. Plant of the grass family 7 183-184.
Sugar Loaf. Gigantic rock (1,230 ft.) at entrance of Rio de Janeiro harbour 6-403 illus.
Sugar Loaf. Mt. in Monmouthshire, Eng., 1,955 ft., 5-216.
Sugar Maple. Tree, 5-117 illus.
Sugria [soo'ia], *Gulthermina* (1888-1950). Portuguese musician; world reputation as cellist.
Suiho dam, on Yalu r. between Korea and Manchuria, 3 20.
Suir. r. of Ireland rising in S. Tipperary; flows 85 m. to Waterford Harbour, 4-281.

Suk. Covered market at Baghdad 4-280.

Sukkur Dam. See Lloyd Barrage.

Suleiman the Magnificent. See Solymann.

Sulgrave Manor. Old manor house in village of Sulgrave, Northants, Eng. Ancestral home of George Washington's family; now a museum, 7-420.

Sulitelma. Mt. (6,180 ft.) in Kjølen range, Norway, 5-462.

Sulla, Lucius Cornelius (138-78 B.C.). Rom. general; conquered Mithridates (84); died as dictator, extinguishing Marian party in cruel proscriptions; 6-433.

Sullivan, Anne (1866-1936). Amer. teacher of Helen Keller, the blind, deaf mute; 4-395.

Sullivan, Sir Arthur Seymour (1842-1900). Brit. composer, best remembered for collaboration with Sir W. S. Gilbert in their series of comic operas, 4-20 with illus.

Sullivan, John Lawrence (1858-1918). American pugilist. In 1889 won heavyweight championship of world by defeating Jake Kilrain in 75 rounds. Beaten by Jim Corbett (1892); 2-30.

Sully, Maximilien de Béthune, Duc de (1560-1641). Fr. statesman and financier, great minister of Henry IV.

Sully-Prudhomme (sül'prüdöm), **René François Armand** (1839-1907). Fr. poet. Awarded Nobel prize for literature (1901). Works include *Les Solitudes*; *Le Bonheur*.

Sulpha Drugs, 7 186, 3-127, 5 52.

Sulphanilamide. First of the sulpha drugs to be discovered, 7-186.

Sulphapyridine. Later name for M and B, a sulpha drug, 7-186.

Sulphate. A salt of sulphuric acid.

Sulphite. A salt of sulphurous acid.

Sulphonamide drugs. Same as Sulpha Drugs.

Sulphur (S). Non-metallic element of the oxygen group; atomic no. 16; atomic weight 32.066; melts at 112.8° C.; 7 186, 3 224; in alchemical theory, 1 95; in fireworks, 3 361, from Mt. Etna, 3-301.

Sulphur Dioxide, 7-187; in refrigeration, 6 378.

Sulphuretted Hydrogen (hydrogen sulphide), 7 186.

Sulphuric Acid, 7 187, 1-12; in mfr. of hydrochloric acid, 4-215.

Sulphurous Acid. An unstable compound decomposing readily into sulphur dioxide and water; as disinfectant, 3-92.

Sulphur Trioxide, 7-187.

Sultanas. Dried seedless sultana grapes, 6 361.

Sulu Islands. Group forming S.W. portion of Philippine Archipelago.

Sumach (sümák). Any of several small trees or shrubs with feathery leaves, of the genus *Rhus*.

Sumatra. Isl. of Indonesia; area 165,000 sq. m.; pop. 12,000,000; 7 187; in 2nd World War, 7 491.

Sumatran Rhinoceros, 6-392.

Sumer (süm'et). Anc. name of Babylon, used in cuneiform inscriptions together with "Akkad," each probably referring to whole country.

Sumerians. Anc. people of Babylonia; culture of, 1-336, 5-176.

Sumer is Ioumen in. Oldest recorded specimen of Eng. music, 5-304.

Summer Palace, Peking, 6-108 illus.

Summerside. Tn. on Prince Edward Island, Canada; pop. 6,547; 6-288.

Summer Time Act (1916, 1922, 1925). Brit. Act of Parl. by which official time is advanced one hour at 2 o'clock G.M.T. in the morning of the day following the third Saturday in April or, if that day is Easter Day, the day following the second Saturday, and put back to Greenwich mean time at 2 o'clock in the morning of the day next following the first Saturday in October. Summer Time remained in force from Feb. 1940 to Oct. 1945, during 2nd World War (with Double Summer Time at some periods); 3-55.

Sun, 7-188, 189 illus.; in Arctic circle, 1-220; atomic theory of energy, 1-301; and Aurora borealis, 1-311 illus. f.; and climate, 2-109; colour of light and atmosphere, 1-81, 80 diags.; effect on comets, 2-468; attraction on earth's surface, 4 67; and origin of earth, 3 119; eclipse, 3-156, 157 illus. f.; 7-188 illus. f.; elements in, 1 284; as a source of energy, 4 116; equinox and solstice, 3-294, as kind of fire, 3 357; hydrogen in, 4-221; influence on ionosphere, 6-344; latitude determined by, 5-338; sunshine on moon, 5 257 illus. f.; midnight sun, 5 200; depth sunlight reaches in ocean, 5 496; rainbow, 6 360; and seasons, 6 526; as short-wave radio transmitter, 6 339; speed and direction, 7-146; speed of light from, 4-108; sunlight and bacteria, 1-344; surface of, 1 280 illus.; estimated temperature, 3 190, 4 277; and tides, 7 275; and time reckoning, 7 277; ultra-violet rays from, 7 314; worshipped by Incas, 6-143; worship of, and lamps, 4 142; and the Zodiac, 7 324.

Sun and planet gear. An epicyclic system of gears revolving within a large outer gearwheel; invented and used by James Watt in 1781; now used in certain makes of car gear boxes and bicycle two speeds.

Sunburn. Caused by ultra-violet rays from the sun, 7 314.

Sunda Islands. Group in E. Indies extending from Malay Peninsula to the Moluccae; includes Sumatra, Java, Borneo, Celebes, and smaller isls.

Sundanese. A people of Java, 4 355.

Sundareswara. Temple at Madura, Madras state, India, 5 70 illus.

Sunday. First day of the week, the Christian Sabbath; 6 483; origin of name, 3 35.

Sunday School movement. Robert Raikes and, 2 420.

Sunderland. Spt. of Durham, Eng., at mouth of river Wear; large docks, industries incl. shipbuilding, marine engineering and pit prop mfr.; aluminium bridge at, 1 129; cast-iron bridge, 2 66.

Sundew. Plant which traps insects for food, 7 190, 5 141, 2 21 illus. f.

Sundial. Device for measuring time, 2 112, 7-277.

Sunfish, 7-190.

Sunflower, 7 190, 191 illus.

Sungari. R. in Manchuria, tributary of the Amur, 800 m. long, 5 113.

Sung (soong) dynasty (960-1280). One of the great Chinese dynasties under which arts and letters flourished; 2 363.

Sunium. Promontory of S.E. Attica, Greece; modern Cape Colonna.

Sun King, The. Name given to Louis XIV of France, 5-42.

Sunlight, and living organisms, 1 148.

Sun'ites. Members of the orthodox Mahomedan sect, predominating in Arabia and Turkey, 5 89.

Sunshade (Parasol). A portable shade from the sun, 7 345.

Sun-spots, 7 189 with illus. f.

Sun Yat-sen (1867-1925). Chinese revolutionary leader; chosen provisional pres. of Chinese Republic (1911); resigned 1912 in favour of Yuan Shih-kai; elected pres. 1921 by southern parl. and led military campaign against Peking; 2 375; and Chiang Kai-shek, 2-333; tomb, 5-316.

Suome. Finnish name for Finland, 3-354.

Supercalender. In paper-making, 6-71.

Supercharger. Device, in the form of a rotary compressor pump fitted to motor-car and aircraft piston-engines, to increase the pressure at which the mixture of air and fuel is supplied to the cylinders.

Supercooled Liquids, glass as, 4-520.

Superfluidity, in helium (phenomenon described), 4-160.

Superfortress. Amer. bomber of 2nd World War, 1-36 illus.

Superior, Wisconsin, U.S.A. One of two

most westerly ports of Great Lakes, at head of Lake Superior, opposite Duluth, Minnesota, pop. 35,245.

Superior, Lake. Most northern of Great Lakes of N. Amer.; largest body of fresh water in the world; area 31,820 sq. m.; 7 191, 4 68, 2-196; map, 4-69; iron-ore fields, 4-293.

Superphosphate. Soluble form of calcium phosphate; as fertiliser, 6-162, 2 166.

Superstitions; bells and evil spirits, 1-424; cats and, 2-263; caves and, 2-281; Chinese footstaver, 2-386 illus.; sign of the cross, 2 536; sorcery by dolls and effigies, 3 104; and drowning people, 4 193; fairies, 3-337; fire legends, 3 146; lucky on days, 4 104; Halloween legends, 4 120; connected with hares, 4-132; wearing of protective jewelry, 4 373; and magic, 5-77; and marriage customs, 5 131; meismals, 5 175; and mistletoe, 5 228, 2 381; connected with moon, 5 259, and natural gas, 5 341; New Year's Day customs, 5 110; Odin's hunt, 5 500; among Scott Lapps, 4 117.

Supporters. In heraldry, 4-165.

Suprarenal Glands, 4 28.

Supremacy, Acts of (1534 and 1559), in Reformation of Eng. Church, 2 381.

Supreme Council. Allied councils convened during and following both World Wars; existed for the purpose of promoting united action and co-operation upon agreed points.

Supreme Council of U.S.S.R. instituted by Stalin, 6 473.

Supreme Court of Judicature. Principal law court of Eng. and Wales, comprising the High Court of Justice, which consists of several divisions, and the Court of Appeal.

Sur. Mod. tn. on site of Phoenician Tyre; pop. 5,000; 6 161.

Surajah Dowlah (c. 1732-57), Nawab of Bengal, who perpetrated Black Hole massacre, 2 174; defeated by Clive at Plassey, 2 111, 4 232.

Surat (soorah't). Rep. of India, Spt., 160 m. S. of Bombay; pop. 171,443; trade centre 16th to 18th cents., 2-83.

Surcouf. Giant Fr. submarine, 361 ft. long, displacement 2,880 tons, submerged for 60 hrs., entered service in 1931; at full of Fr., June 1940, taken over by Brit.; in Apr 1942 reported lost by Free Fr., 7 175.

Surfaces, 7 191, 192, 193 illus.; importance as catalysts, 2 322.

Surface Tension, 7 191.

Surf-bird. A plover-like shore bird, found on the Pacific coast of Amer.

Surf-riding, in Australia, 1 321 illus.; in Hawaii, 4-139 illus.

Surgeons, Royal College of. Corporation for the advancement of surgical knowledge; grants the diplomas of M.R.C.S. and F.R.C.S.; 7 104.

Surgery, 7-194; anaesthetics in, 1 112, 113; antiseptics, 1 176; lighter as pioneer in, 4 208; nylon sutures, 5 188; pentamethonium and bloodless operations, 1-143; surgical needles, 5-362.

Surgical Needles, 5-362.

Surinam or Netherlands Guiana. Overseas territory of the Netherlands on N.E. coast of S. Amer.; area 55,115 sq. m.; pop. 221,000; 5 370. See also Guiana.

Sur le Pont d'Avignon. Old Fr. song, 1-330 illus. f.

Surnames, and their origins, 5-314.

Surrealism. Art movement of 20th cent., directed at the representation of dreams with their symbols; an offshoot of Dadaism, and influenced by writings of Freud, together with paintings of Giorgio de Chirico (b. 1888), Marc Chagall (b. 1887), and Salvador Dali (b. 1901); 3 449.

Surrender of Breda, The. Painting by Velazquez; as example of good manners, 5-115 illus.

Surry, Henry Howard, Earl of (c.1517-47). Eng. poet, soldier, and courtier who introduced blank verse into Eng., and, with Wyatt, the sonnet; beheaded on trumped-up charge of treason; 3 284.

SURREY

Surrey. Co. of S. Eng.; area 722 sq. m.; pop. 1,601,555; 7-195; North Downs, 3-110.

Surtax. An additional tax on incomes above £2,000, 7-231.

Surtees, Robert (1770-1824). Brit. antiquary and topographer; his chief work, *History of Durham*, deals with the place of his birth; he contributed to Scott's *Border Minstrelsy* two original ballads of his own.

Surtees, Robert Smith (1803-64). Brit. novelist; made a great success with his sporting novels *Jorrocks's Jaunts and Jollities*, *Handley Cross*, and *Ask Mammy*; 3-425.

Surveying. 7-195; and trigonometry, 7-317; as a career, 2-240.

Survival of the fittest. In biology, and natural selection, 1-156.

Susa. Anc. city (Biblical Shushan) of Persia near Shuster; excavations of ruins have revealed interesting objects; Alexander and, 1-99, 6-132.

Suspension Bridges. 2-66, 65 illus.

Suspension Railway. 6-359.

Susquehanna [suskweh'na]. R. of U.S.A., rising in Lake Otesago, N.Y.; flows 500 m. S. through Pennsylvania to Chesapeake Bay; 6-119.

Sussex. Maritime co. of S. Eng.; area 1,457 sq. m.; pop. 936,744; 7-196; South Downs, 3-110.

Sutcliffe, Herbert William (b. 1894). Eng. cricketer; great opening batsman for Yorkshire and England, who set up several records in partnership with J. B. Hobbs, P. Hignett, etc.

Sutherland, Graham (b. 1903). Brit. painter, 3-262; portrait of Somerset Maugham, 3-260 illus. f.

Sutherlandshire. Co. of Scot. in extreme N.W.; area 2,028 sq. m.; pop. 13,664; co. tn. Dornoch; 7-197.

Sutlej or **Satlaj**, R. of Pakistan and India; largest of "five rivers" which give name of Punjab; rises in Tibet and flows 1,000 m. to Indus; 6-310, 6-44, 4-259.

Sutras. Hindu writings concerning laws and ceremonies, 4-250.

Sutro, Alfred (1863-1933). Brit. author and dramatist; his plays include *The Walls of Jericho* and *John Gayde's Honour*; also translations of works by Maeterlinck.

Suttee. Indian practice by which widows, especially of high caste Brahmins, burned themselves on their husbands' funeral pyre. Practice made illegal (1829) but continued until late 19th cent.; 4-252, 5-135.

Sutton Coldfield. Tn. of Warwickshire, Eng., 8 m. N.W. of Birmingham; pop. 47,600; television station.

Sutton Hoo. Site of ship burials in Suffolk, Eng.; archaeological finds, 1-204 illus.

Suva. Cap. and city (1953) of Fiji Is.; pop. 11,398; 3-352.

Suvorov, Alexei Vasilievich (1729-1800). Russian general, 6-474.

Suwanee [suwah'nee]. River, stream in U.S.A., flowing from S. Georgia to Gulf of Mexico; the "Suwanee River" of "The Old Folks at Home," 3-293.

Svalbard. Geog. term for Norway's northern colonial possessions. See Spitzbergen.

Svealand. Middle province of Sweden, 7-201.

Sverdlovsk, formerly Ekaterinburg; pop. 456,500; mining centre of U.S.S.R. on r. lact at E. foot of Ural Mts.; contested between Bolsheviks and anti-Bolsheviks in 1918-19; place of imprisonment and execution of Tsar Nicholas II and family; 6-472.

Swabia. Medieval duchy of S.W. Ger.; flourished under Hohenstaufens; disintegrated into small states in 1668; great Swabian League for mutual protection (1488-1634); now name of Bavarian prov.

Swaffham. Market tn. in Norfolk, Eng.; pop. 2,863; agricultural trade; cattle and sheep fairs held, 6-448.

Swahili [swahb'li]. An African people of Bantu stock, with some mixture of Semites; they are Ma-

medians and are noted as traders; number less than 1,000,000.

Swale. Eng. r. rising on border of Westmorland and flowing 60 m. through N. Riding of Yorks. to join the Ure and form the Ouse, 7-515.

Swallow Dive in swimming, 7-210, 209 illus.

Swallows, Martins, and Swifts. 7-197, 198 illus.; egg, 1-452 illus. f.; migration, 1-456, 5-204 illus. f.

Swallowtail butterfly. 7-137, 138 illus.; caterpillar, 2-263 illus.

Swallowtail moth. 2-114 illus.

Swan, Sir Joseph Wilson (1828-1917). Brit. inventor. Invented electric carbon filament lamp that bears his name, 2-220; and rayon, 6-368.

Swan, 7-196, 199 illus., 1-461 illus.

Swan, R. of Western Australia entering Indian Ocean at Fremantle 12 m. below Perth; 6-138.

Swanage. Holiday resort on Isle of Purbeck, Dorset. Sandy beach with peculiar double high tide. Purbeck stone is quarried; pop. 6,850; 3-107.

Swan Lake. Ballet with music by Tchaikovsky, 1-352 illus. f.

Swan Murrelet. 6-232 illus. f.

Swansea. Tn. in Glamorganshire, Wales; pop. 161,000; 7-200, 7-411, 4-27; old copper-smelting industry, 2-503.

Swan-apping. Marking of swans to denote ownership, 7-199 illus.

Swarming of bees, 1-108 with illus.

Swastika, ancient symbol of good luck, adopted as symbol of Ger. (Nazi) govt.; 2-535.

Swatow. Port in prov. of Kwangtung, S.E. China, on Han r. near mouth; pop. 200,000; exports sugar.

Swaziland [swah'ziland]. Brit. protectorate in S. Africa at S.E. corner of Transvaal; area 6,704 sq. m.; pop. 185,215; exports tin; cap. Mbabane; 7-88, 89.

Sweat Glands. in skin, 7-63.

Sweat Hut, of the Siwash Indians, 6-375 illus.

Sweden. Country of N. Europe occupying E. part of Scandinavian peninsula; area 173,378 sq. m.; pop. 7,040,920; 7-200; map, 5-463; flag, 3-384 illus. f.; cap. Stockholm, 7-158, 7-204 illus. f.; climate, 7-200; education, 7-203; fisheries, 7-203; forests, 7-202; hydro-electric power, 7-202; minerals, 7-202, 201 illus. f.; money, 5-235 illus.; products, 7-203; timber production, 7-201 illus. f.; sports, 7-203; literature, 7-203; Uppsala cath., 7-203 illus. f.

RULERS OF SWEDEN (FROM 1523)

HOUSE OF VASA

1523-60 • Gustavus I, Vasa
1560-69 • Eric XIV
1569-92 John III
1592-1604 Sigismund III
1604-11 Charles IX
1611-32 Gustavus II, Adolphus
1632-54 • Christina

HOUSE OF PFALZ

1654-60 Charles X
1660-97 Charles XI
1697-1718 Charles XII
1718-20 Ulrica Eleonora

HOUSE OF HESSE

1720-51 Frederick I

HOUSE OF HOLSTEIN-GOTTORP

1751-71 Adolphus Frederick
1771-92 Gustavus III
1792-1809 Gustavus IV
1809-18 Charles XIII

HOUSE OF PONTE CORVO

1818-44 Charles XIV, John
1844-59 Oscar I
1859-72 Charles XV
1872-1907 Oscar II
1907-50 Gustavus V
1950- Gustavus VI

SYLPHIDE, LA

History. 7-203, 204, 3-314, 315; rule in Finland, 3-355; the Union of Kalmar, 7-203, 3-465; Gustavus Vasa, 7-203; Gustavus Adolphus, 7-203, 7-270, 1-248.

Swedenborg, Emanuel (1688-1772). Swedish scientist, philosopher, mystic and religious leader, 7-204.

Sweet Bay. Alternative name for Victor's laurel, 4-456 illus.

Sweetbread. See Pancreas.

Sweet Briar. Wild rose, formerly called eglantine, 6-453.

Sweet Chestnut. See Chestnut.

Sweet Corn. Variety of maize, 5-90.

Sweet Gum or **Liquidambar.** Tree of witch-hazel family; exudes a resinous gum.

Sweet Jazz. Type of music, 4-357.

Sweetmeats. Liqueur in, 4-521; marshmallow, 5-97.

Sweet Pea. Flowering plant, 6-99, 2-23.

Sweet Potato. A native perennial herb of S. America, of great food value.

Sweet Violet. 2-24 illus. f.

Sweet William. A perennial herb, native of S. and E. Europe; was introduced into Eng. in 16th century.

Sweyn [swān] **Forkbeard** (d. 1014). King of Denmark; ravaged Eng. yearly after massacre of Danes at Brice's Day, 1002; 3-71, 2-215.

Swift, Jonathan (1667-1745). Irish-born satirist of Eng. parentage, 7-204, 205 illus., 3-287; *Gulliver's Travels*, 7-205, 2-351.

Swift. Bird, 7-198; migration, 5-201 illus. f.; nest used for soup-making, 4-355.

Swilly, Lough. Irish Rep. Inlet of the N. coast of Donegal; 25 m. long and about 3 m. broad; fine harbour formerly used by Royal Navy.

Swimming and Diving 7-207; how a skater swims, 7-59 illus.

Swinburne, Algernon Charles (1837-1909). Brit. poet, 7-210, 3-291.

Swindon. Tn. and rly. centre of Wilt; 72 m. W. of London; pop. 68,332; large locomotive and rly. engine works; 7-457, 5-6, 7 illus.

Swing. Type of music, 4-357.

Swing Bridge. 2-68, 67 illus.

Swiss Family Robinson. Children's tale by Johann Rudolf Wyss (1781-1830), pub. 1812-27, of a family cast away on an uninhabited Isl., 2-366.

Swiss, or Papal, Guard. Consists of about 120 officers and men of Swiss nationality, performing guard and other duties at Vatican in Rome, 7-383 illus.

Switchboard (telephone) 7-215, 212 illus.

Swithin, Saint (d. 802). Bishop of Winchester, 6-458.

Switzerland. Small mountainous country of Europe; area 15,914 sq. m.; pop. 4,714,992; 7-211, 212, 213 illus.; map, 7-214; flag, 3-384 illus. f.; Alps, 1-125, 126, 7-212 illus. f.; children, 2-348 illus.; elections, 3-209; industries, 7-212; lakes, 7-211; Lucerne, 5-11; minerals, 7-212; mountains, 7-211; national anthem, 5-326; railways, 5-1, 6-358, 359 illus., 5-11 illus.; rivers, 7-211, 213 illus.; history, 7-213.

Sword of Stalingrad. 7-142 illus.

Swordfish. 7-215, 6-128.

Sword of State. In Brit. regalia 2-566.

Sybaris. Anc. city of S. It., proverbial for luxury (hence "sybarite"), destroyed 410 B.C.

Sycamore. Tree, 7-215.

Sydmonton Hills. Hants, Eng.; 4-12.

Sydney. Cap. of N.S.W., Australia, 7-216, 1-317; bridge, 2-66, 6 illus.; harbour, 4-130 illus.; 2nd World War, 1-322.

Sydney. Tn. in Nova Scotia, Canada; pop. 31,317; 5-409.

Sydney Cove. Largest settlement in Greenland; pop. 1,000; 4-94.

Sylhet. Dist. and tn. of E. Bengal (Pakistan); area 5,478 sq. m.; pop. (dist.) 3,116,000 (tn.) 19,000; 1-276, 6-41; tea plantations, 6-41.

Syllogism. Form of logical argument Aristotle and, 4-228.

Sylphide, La. Romantic ballet; Tchaik. and, 1-351.

AMATEUR SWIMMING RECORDS

Men's Free-Style

	World record	British record
100 yds. ..	48.9 s. E. Moore (U.S.A.), 1956	52.2 s. J. C. Wardrop (Scotland), 1952
220 yds. ..	2 m. 3.4 s. J. C. Wardrop (G.B.), 1955	2 m. 8.0 s. J. C. Wardrop, 1954
140 yds. ..	4 m. 28.1 s. J. B. Marshall (Australia), 1951	4 m. 39.5 s. N. J. McKechnie, 1955.
840 yds. ..	9 m. 34.3 s. M. Rose (Australia), 1956.	10 m. 3.6 s. J. C. Wardrop, 1952.
1 mile ..	19 m. 40.1 s. G. Breen (U.S.A.), 1956.	20 m. 53.2 s. J. C. Wardrop, 1952

Over Metric Distances (world records):

100 metres .54.8 s. E. Cleveland (U.S.A.), 1951	1,500 metres .18 m. 5.9 s. G. Breen (U.S.A.), 1956
200 metres 2 m. 3.4 s. J. C. Wardrop (G.B.), 1955.	4 x 100 metres .3 m. 16.8 s. relay Nat Team of Japan 1953.
400 metres .4 m. 26.7 s. F. H. Konno (U.S.A.), 1954	4 x 200 metres .8 m. 29.4 s. relay Yale Univ. (U.S.A.), 1952.
800 metres 9 m. 30.7 s. F. H. Konno (U.S.A.), 1951	

Sylt. Ger. Isl. of N. Frisian group, in N. Sea, off Schleswig; a narrow bank, 22 m. long and less than 1 m. wide except in centre.

Sylvester II (c. 945-1003). Pope, 999-1003. First Fr. pope. Famous for scientific inventions which included a pendulum clock and a hydraulic organ. Also credited with introduction of Arabic numerals to the West.

Sylviidae [silvī'dē]. Bird family which comprises the warblers.

Symbiosis. In biology, a partnership between dissimilar plants or animals, e.g. lichens, 4-190.

Symbol. A visible thing which represents an invisible object, or a whole idea; all religious symbols extensively. See also lists under **Algebra** and **Arithmetic**, **Astronomy**, **Geometry**, **Music**.

Symbolists. School of Fr. poets of late 19th cent., in reaction against classical Parnassian school; leaders Mallarmé, Rimbaud.

Syme, James (1799-1870). British

surgeon; and waterproofed cloth, 6-464.

Symington, William (1763-1831). British engineer, inventor of marine steam-engine.

Symonds, John Addington (1840-93). Brit. critic, author of the monumental *History of the Renaissance in Italy*.

Symond's Yat. Herefordshire, Eng.; beauty spot on r. Wyre, 3-251 illus.

Sympathetic Inks. 4-261, 262.

Sympathetic Nerve. 4-115.

Sympetrous Flowers. Flowers having united petals; term used in botany.

Symphony. In music 5-305. Beethoven and, 1-112.

Symphony Orchestra. 5-527, 528 illus.

Synagogue. Jewish place of worship; Jews mourning in, 4-374 illus.

Synceapous Flowers. Flowers whose petals are joined together.

Synchronous Motor. Type of electric motor, 5-276.

Synchrotron. A modification of the cyclotron, 3-20, used to accelerate protons or electrons in atomic bombardment

Synceopation. In jazz, 4-387.

Syndicalism. An anti-parliamentary labour movement originating in France in 19th cent. Aimed at control of individual industries by workers' trade unions and favoured general strike weapon as means to supreme power.

Synge [sing]. John Millington (1871-1909). Irish playwright; *Riders to the Sea*, *The Playboy of the Western World*; 4-287, 3-122, 3-291.

Synthesis. In chemistry, the building up of a compound from its elements, or other compounds; 2-324.

Synthetic Fibres. used in cloth, 2-120; nylon, 5-487 and Terylene, 6-369.

Synthetic Resins. 6-219, 6-389.

Synthetic Rubbers. 6-466.

Syon House. Middx., Eng. A seat of the Duke of Northumberland; notable gardens; Adam's work on, 1-14.

Syracuse. Trin. In Sicily, founded by Greeks in 731 B.C., 7-49; Roman siege and Archimedes, 1-208.

Syr Daria. It. of cent. Asia (the anc. Jaxartes), flowing 1,600 m. from Tien Shan Mts. to Aral Sea; irrigation, 6-478.

Syria. State on E. borders of Mediterranean; area 72,231 sq. m.; pop. 3,253,000; 7-217, 218; flag, 3-386 illus. f.; cap. Damascus, 7-217 oil pipeline, 7-218; history, 7-218 and Assyria, 4-337; as Fr. mandate, 7-183; in 2nd World War, 7-490 war with Israel, 1-195, 4-303.

Syrian Bear. 1-390 illus.

Syrian Desert. 1-190, 3-78.

Syrian Pound. See **Money** (list).

Syringa [siring'ga]. Bot. name for lilac genus of shrubs of family *Oleaceae*. Another syringa (or mock-orange) is a shrub of the saxifrage family.

Syrinx. In Gk. myth., a beautiful nymph beloved by Pan, 6-52.

Syrinx. Anc. musical instrument, 5-309, 5-302.

Systolic Pressure. of the blood, 1-492.

Szoezin (formerly Stettin). Former Ger. Baltic port on r. Oder, 17 m. above mouth; pop. 178,210; shipyard; clothing mfrs. (ceded to Poland 1945; 6-238, 4-1).

Szechwan [sech'wahn']. Prov. of w. China; area 168,000 sq. m.; pop. 45,845,800; cap. Chengtu; cereals, sugar, tobacco, silk, coal, iron, salt.

Szeged. Second largest tn. of Hungary on r. Theiss; pop. 136,752; 4-205.

Szeklers [sek'lerz]. People of Rumania.

Szigetvar. Trin. in Hungary, captured by Turks in 1566. 7-333 illus.

T

THE original form of T in the Egyptian hieroglyphics is the picture of a noose or a lasso, or, as some scholars think, that of a tongue. The Phoenicians made it in the form of a cross X + with the four arms of equal length. They and the Hebrews used it as a sign for marking the ownership of animals and for other identification purposes; the name was *tau*. Early Greeks

moved the horizontal to the top and so made the T we have to-day. Examine the small form of the letter (t) as it is printed to-day; notice that the upper left angle of the t-bar is rounded, whilst the right is sharp. This originated in the old manuscripts when the horizontal bar was made first, from right to left, and the vertical stroke added without taking the pen off the paper.

Taal. Volcano on Luzon Isl., Philip-pines; crater 7,650 ft. across.

Taal, Dis. See **Afrikaans**.

Tabad. Military cloak of 15th cent.; now sleeveless coat worn by royal heralds, 4-165 illus.

Tabad Inn. Southwark, London; and Canterbury pilgrims, 2-311.

Tabasoo [tabas'kō], Mexico. State in N. of Isthmus of Tehuantepec, on Gulf of Mexico; area 9,782 sq. m.; pop. 285,800. Also name of variety of pepper, 6-121.

abashir. Substance found in bamboo; used as medicine, 1-359.

Tabernacle ("tent"). Tent-like port-

able structure erected by Israelites in wilderness as place of worship; name later applied to the Temple at Jerusalem, and hence to other houses of worship.

Tabernacles, Feast of. Annual autumn harvest festival of the Jews, commemorating dwelling in tents in the wilderness.

Table, furniture. 3-490.

Table Mountain. nr. Cape Town, S. Africa, 2-217, 216 illus.

Table Tennis. An indoor sport, 7-219.

Players change ends after every 5, not 10, points as stated in 7-219.

Taboo. Among primitive races the

sacred prohibition of certain acts or the use of certain things, 5-78, 79 illus.; in Pacific Isl., 6-31.

Tabor, Mt. (Jebel Et-Tūr). Famous mt. of Palestine; height 1,840 ft., 6-47 illus.

Tabriz [tabrōz']. City of Persia in extreme N.W.; pop. 272,000; repeatedly devastated by earthquakes; 6-134.

Tabulating machine. 2-168 illus.

Tacamahac. N. Amer. Indian name for poplars, especially the balsam poplar (*P. balsamifera*).

Tacana. Mt. in Guat-mala, Cent. Amer. (13,330 ft.), 4-101.

TACHOMETER

Tachometer (takom'iter). Instrument for counting revolutions per minute of the shaft of a machine.

Tacitus (tak'itus), Cornelius (c. A.D. 55-c. 119). Rom. historian, great Latin stylist, 4-451, 4-181; and Agricola, 1-440, 1-69.

Tacking. See **Nautical Terms** (list).

Tacking, in sewing, 7 6.

Taco'sa, Washington, U.S.A. Spt. on Puget Sound; pop. 113,673; mfrs. flour, copper ware, lumber, and machine-shop products; 7-423.

Tactical Air Force, 2nd (T.A.F.). Over-seas command of R.A.F., 6-462.

Tadpoles. The larval young of amphibians, 3-472; in aquarium, 1-188; of newt, 5 407; *The Tadpole Who Wanted to be a Frog* (story), 3-473.

Tadzhikistan. Republic of the U.S.S.R. in cent. Asia; area 55,700 sq. m.; pop. 1,500,000; cap. Stalinabad; 6-478; *Tamir Panteu* in 1-284.

Taff. R. of Wales, 33 m. long, 4 27.

Taffeta. A somewhat general term used for plain, smooth silk with a lustre, or for silk rayon, or cotton, woven in lines so fine as to appear plain woven; in 16th cent. a heavy costly fabric, later a soft thin silk.

"Tafttrail". Pen-name of Capt. Henry Tappell Dooling (b. 1883), naval officer, author of many books for boys on naval life and a standard work on medals and decorations.

Taffrail. See **Nautical Terms** (list).

Taft, Robert A. (1889-1953). U.S. politician, son of Pres. W. H. Taft; senator in 1939; in 1946 and 1944 unsuccessful candidate for pres.; Republican and isolationist; influential in passing Taft-Hartley Labour Act against the trade union "closed shop" policy in 1947.

Taft, William Howard (1857-1930). 27th pres. of U.S.A.; for many years a noted lawyer; was secretary of war in Theodore Roosevelt's cabinet, Pres. U.S.A. 1909-13.

Taillon, Marie (1804-84). Ill. ballet dancer, most famous dancer in Europe 1827-47; introduction of romantic ballet, 1 351.

Tagore (tag'or), Sir Rabindranath (1861-1911). Hindu poet, philosopher, and educator, 4-250.

Tagua (tag'wah), the "vegetable ivory" palm. See **Corozo Nut**.

Tagus. Longest r. in Iberian peninsula; rises in Spain in the Sierra de Almaraz, flows through Toledo and Alentejo to estuary nr. Lisbon; length 565 m.; Lisbon harbour on, 4 521; bridge, 2 66, 65 illus.

Tahiti (tah'hē'tē) or **Otaheite**. Largest of Society Isls. in S. Pacific; area 600 sq. m.; pop. 21,820; Papeete harbour, 6 27 illus.

Taiga. Subarctic coniferous forest which spreads across N. of N. Amer., Europe, Asia, S. of the tundra. Chief trees pines, firs, spruce, larch; 3-121.

Tail, of lizards, 4-528; in mammals, 5-102.

Tailor Bird. A native of Asia, so named from the way it builds its nest using its bill as a needle.

Tailplane, in aeroplane, 1-32, 30 diag.

Tailfin Games. Anc. Irish sports meeting, 1-292.

Taine (tān), Hippolyte Adolphe (1828-93). Fr. literary and art critic, philosopher, and historian; analysed art and literature scientifically as products of race and environment.

Taipei. Cap. of Formosa; pop. 340,114; 3-423.

Taiiping (ti'ping) Rebellion, in China (1850-61), 4 48.

Taiwan. See **Formosa**.

Taj Mahal. Famous mausoleum, overlooking the Jumna r. nr. Agra, India, 7-219, 220 illus. f., 4-249.

Tajumulco. Mt. in Guatemala, Cent. Amer. (13,811 ft.), 4-101.

Takla, Makhan Desert. W. region of Gobi desert, Sinkiang, 1-226, 3-78, 70 illus.

Takoradi. Port of Gold Coast, W. Africa; pop. 44,130; 4-41.

Taku, China. Strongly fortified spt. guarding approach to Tientsin and

Peking; captured by Brit. and Fr. fleets (1858, 1860) and by allied troops (1900) during Boxer uprising.

Talara. Spt. in northern Peru, centre of petroleum industry; pop. 14,467; 6 111.

Talavera de la Reina (talahvār'aīā lah'rā'na) (Rom. *Caesobriga*). Tn. of cent. Spain on c. Tago; pop. 11,500; victory of Wellington over French (1809), 6-117, 7-137.

Talbot, William Henry Fox (1800-1877). Brit. inventor and pioneer in photography; a photograph made by his Calotype process in 1835 is the oldest direct photograph in existence; 6-170.

Talca, Chile. Cap. of prov. of Talca on Rio Claro; pop. 56,700; makes blankets.

Talcahuana (talkahwah'na), Chile. Spt. and naval station on Bay of Concepción; pop. 41,530; important wheat exporting point.

Talent. An ancient weight and denomination of money; Attic talent equal to about 240 gold sovereigns; great Rom. talent about 100; small Rom. about 75; Hebrew, Assyrian, and Babylonian from 310 to 400 gold sovereigns.

Tales of Hoffman. Opera by Offenbach; story, 5 520.

Talisman, The. Novel by Sir Walter Scott; Saladin in 6 188.

Tallahassee. Cap. of Florida state, U.S.A.; pop. 27,237; 3 393.

Tallal (b. 1909). King of Jordan; eldest son of Abdullah; resigned crown to Hussein, his son, in 1952, 4-382.

Talleyrand-Périgord, Prince Charles Maurice de (1754-1838). Fr. statesman, 7 220.

Tallien (tal'sen), Jean Lambert (1767-1820). Fr. revolutionary, leading Terrorist; he was chiefly responsible for fall and execution of Robespierre.

Tallinn, or **Reval**. Cap. of Estonia S.S.R.; spt. on Gulf of Finland; pop. 116,000; 3 299.

Tallith. Ritual garment worn by Jews in a synagogue, 4 374 illus.

Tallow. Fat, compound of glycerine and fatty acids; in candles, 2 210.

Tallow-Tree. Tree of China, India, and other warm regions, having seeds covered with greasy white substance used by Chinese in making candles, soap, etc.; also butter or tallow tree of W. Africa, yielding yellow greasy juice.

Tally Sticks, in early commerce, 2-167.

Talma, François Joseph (1763-1826). Fr. tragedian; introduced practice of dressing in costume appropriate to time and country of play.

Talmud. Body of Jewish law, 4-151; accumulation of centuries of study.

Tal-y-llyn. Lake in Merionethshire Wales, 2 m. long and $\frac{1}{2}$ m. wide; 5-175.

Tamar. R. of s.w. England, flowing between Devon and Cornwall to Eng. Channel; 60 m. long; 2-88.

Tamarind. A pod-bearing tropical tree, 3-479.

Tamarisk. An evergreen flowering shrub, 7-220, 221 illus. f.

Tamatave (tamatah'vā). Spt. of Fr. Isl. of Madagascar; pop. 28,750; meat-preserving plant; rly. to Antananarivo; 5-65.

Tamapulpas (tamahūlpas), Mexico. State in S.E. on Gulf of Mexico; area 30,731 sq. m.; pop. 458,800; cap. Ciudad Victoria.

Tambov (tamboh'v), R.S.F.S.R. Cap. of prov. of same name; pop. 121,300; founded in 1636 as fortress to keep out Tartars; centre of rich agricultural region.

Tamburlaine the Great. Tragedy by Christopher Marlowe, 5-133.

Tamerlane, **Tamburlaine**, or **Timur the Lame** (1336-1405). Tartar chieftain, Timur-i-leng; crowned king of Samarkand in 1369; conquered vast areas of Asia; conquest of Persia, 6-132; of Turkey, 7-334; empire, 6-238.

Tamil. Dialect of S. India, 4-241.

TANNIN

Tamla. A people of S. India and Ceylon, 4-211, 2 297; in Malaya, 5-94.

Taming of the Shrew, The. One of the most popular of Shakespeare's comedies; Petruchio, the hero, tames Katharina, his shrewish wife.

Tammany. Political organization of New York City, U.S.A., founded in 1789 by William Mooney, an ex-soldier, as a non-political, patriotic and benevolent secret society; later notorious as one of the most powerful political "machines" in the world. Identifies itself with National Democratic party.

Tammerfors (Finland.) See **Tampere**.

Tammuz. The Babylonian Adonis, for whom women worshippers wept yearly (Ezek. viii, 11).

Tampa, Florida, U.S.A. Commercial city, port, and winter resort on W. coast on inlet of Tampa Bay; pop. 121,630; cigars, naval stores.

Tampere, or **Tammerfors**. City of Finland; pop. over 100,000; produces textiles, locomotives, paper and leather goods, 3 351.

Tampico (tampē'kō), Mexico. Spt. on Panuco near Gulf of Mexico; pop. 30,000; in rich oil region, 5 186.

Tamworth. Tn. of Staffordshire, Eng., on r. Tame; pop. 12,890.

Tana (tah nah), R. of Kenya, E. Africa, rising on Mt. Kenya; flows 500 m. N.E. to Indian Ocean.

Tanager. Bird, native to tropical forests of Cent. and S. Amer. Two species migrate in summer to U.S.A. and Canada.

Tanagra (tan'agra), Greece. Anc. tn. of Boeotia, 157 B.C. Spartans defeated Athenians there; famous necropolis with terra cotta statuettes (Tanagra figurines).

Tanala. Tribe of Madagascar, 5-65.

Tananarive (Madagascar). See **Antananarivo**.

Tancred (tan'kred) (d. 1112). Norman Sicilian hero of the First Crusade, subsequently prince of Antioch, nephew of Robert Guiscard, cousin and companion-in-arms of Bohemond; portrayed by Tasso (*Gerusalemme Liberata*) as a brilliant, blameless hero, 3-1.

Tandem Bicycle, 3 74 illus.

Tanga. Spt. of Tanganyika Territory, E. Africa; estimated pop. 18,000 (300 white).

Tanganyika. Territory in E. cent. Africa; area 362,000 sq. m.; pop. 7,195,926; cap. Dar-es-Salaam; highest point Mt. Kilimanjaro; 7 221.

Tanganyika, Lake. In E. cent. Africa, area 13,000 sq. m., 7-221, 1-49; discovered by Burton (1858), 2 133.

Tang dynasty (618-907). Rulers of China; porcelain, 2-363, 369 illus.

Tangent. In geometry, line touching a circle or curve at only one point in trigonometry, 7 316.

Tangerine. Variety of orange, 5-521.

Tangier. International port of Morocco N. Africa; pop. 100,000; 7 222.

Tangleweed. See **Oar Weed**.

Tango. Argentine dance, now very popular in Europe. A derivative of the *habanera*, it is a slow dance with a marked rhythm, 3-38.

Tanjore, India. Literary and religious centre in Madras; pop. 68,702; cap. of anc. Hindu dynasty of Cholas.

Tank Engine. Type of locomotive, 5 1.

Tanker. Ship carrying oil in bulk 7-32.

Tanks, in warfare, 7-222, 7-499 illus. in 1st World War, 7-479; Royal Armoured Corps, 1-250; early type, 7-223 illus.; anti-tank weapons, 6-424; training crews, 7-225 illus. Centurion tank, 7-224 illus.; Comet tank, 7-223 illus.

Tan'nenberg. Vill. in E. Prussia; centre of Ger. line in 1st World War bath by which Hindenburg stopped Russian invasion (1914), 7-179.

Tannhäuser. Opera by Wagner, 7-408 story, 5-520.

Tannin or **Tannic Acid**; obtained from oak galls, 5-489; from acacia, 1 5; from pomegranate bark, 6-256; used in ink mfr., 4-261.

TANNING

Tanning of leather, 4-406, 1-8.
Tannu-Tuva (Tuvan People's Republic). Former independent republic under Soviet protection to the s.w. of Mongolia. Incorporated with the R.S.F.S.R. in 1944.
Tansy. Tall herb of the aster family with bitter aromatic flavour.
Tan'ta, Egypt. Tn. and riv. centre; pop. 139,800; noted for fairs and Muslim festivals held every 3 years; 3-173.
Tantalite. Mineral containing tantalum, 7-221.
Tantalum (Ta). Chem. element; atomic no. 73; atomic weight 180.88; melting point 2,996° C.; 7-224, 3 224; and acids, 1-12.
Tantalus. In Gk. myth., son of Zeus, who, for betraying his father's secrets, was condemned to stand for ever in Hades with water all round him and rich fruits above his head, each reaching as he tried to eat or drink. Hence Eng. word *tantalise*.
Taoism. Religion originating in China, 2-366.
Taormina. Holiday resort on E. coast of Sicily; fine scenery, 7 50 illus.
Tao Te King ("Book of the Way and Virtue"). The sacred book of Taoism, written by Lao-Tse.
Tapajós [tápajhósh]. R. of Brazil, flows N. 1,040 m. to join Amazon; navigable about 200 m. above its mouth.
Tap-dancing, 3 10.
Tape-machines, in newspaper office, 5 404.
Tape-recording, 7 47.
Tapestry, 7 224, 226 illus.; Bayeux tapestry, 1 389.
Tapeworm. Parasitic flat worm, 7 500.
Tapioca, 7 228, 2 17.
Tapir. Animal related to hippopotamus and horse, 7 227, 2 illus.
Tappets, in internal-combustion engine, 5 277.
Tapir. R. of India, rising in Madhya Pradesh, length 150 m.; in the Deccan, 4 240.
Tar. Dark, viscous, oily liquid distilled from wood, coal and similar organic substances, 7 227. See also *Coal-tar*.
Tarabulus. See *Tripoli*.
Taranto. Spt. of s. It. on Gulf of Taranto; pop. 191,800; large arsenal, oilers; textile mfrs.; in 2nd World War, 7 490.
Taranto, Gulf of, Italy, 4 304.
Tarantula. A spider, 7 227, 7 135.
Tarascon. Tn. on r. Rhone, Fr.; glass industry and hat mfrs.; pop. 9,000, 6 396. See *Tartarin*.
Tarbes. Tn. in dept. of Hautes Pyrénées, Fr.; horse-breeding and farming; pop. 11,851, 6 311.
Tare. Weight of a vessel, case or other object in which goods are packed; on railway waggon it refers to the weight of the wagon without load. Wagon and load together are "gross" weight, load alone is "net" weight.
Tarentum. Chief anc. Gk. city in s. It.; modern Taranto.
Tarifa [tahré'fah]. Spain. Spt. on Strait of Gibraltar, southernmost tn. of Spain; pop. 12,100; anchovy and tunny fisheries.
Tariff. A list or table of goods giving the rates of customs duty to which they are liable; the term is also applied to the duty itself; in Gt. Brit., 3 12.
Tarik (d. c. 720). Mahomedan chief, leader of first Muslim invasion of Spain.
Tarim. R. of Asia about 1,000 m. long flowing into Lob Nor; 1-266.
Tar'kington, Booth (1869-1946). Amer. novelist (*The Gentleman from Indiana*; *Penrod*; *Monsieur Beaucaire*; *Alice Adams*); 7-365.
Tarnopol. Tn. of Ukraine S.S.R.; pop. 30,000; formerly in Austria, later in Poland; ceded to Russia in 1945; flour mills, distilleries, breweries.
Tarot, or Tarocchi, Cards. Early playing cards, 2-221.
Tarpeian Rock. Cliff of Capitoline Hill, Rome, from which condemned criminals were thrown.

Tarpon. A large herring-like fish found in the s. Atlantic; it affords good sport to anglers off the coast of Florida.
Tarpon Springs, Florida, U.S.A. Tn. and port of w. coast of Florida; pop. 4,323; sponge fisheries, 7-138 illus.
Tarquin. Etruscan family; early kings of Rome, 6-129; Macaulay's *Horatius* and (poem), 5-59. See also *Lucretia*.
Tarquin'ii. An anc. Etruscan city, 45 m. N.W. of Rome; site, near modern Corneto Tarquinia, marked by many remains, especially tombs.
Tarragon. A plant with aromatic leaves; it belongs to the family *Compositae* and is found in the s. of Europe; its leaves are used for flavouring pickles and salads.
Tarragona. Spt. of Spain on Mediterranean at mouth of r. Francolí; pop. 34,000; exports wine, oil; anc. Tarraco, captured by Romans 218 B.C. in Second Punic War.
Tarsus. Splendid anc. city of s.e. Asia Minor; cap. of Cilicia; birthplace of Saul (later St. Paul); modern Tarsus (pop. 71,000).
Tarsus (anatomy). See *Ankle*.
Tartan. Woolen cloth woven with coloured, chequered pattern, 7 228 with illus. f.
Tartar, Cream of, 7 228.
Tartar City, Peking, 6 107.
Tartar Emetic. Antimony potassium tartrate, a highly poisonous white powder, used to fix colours in dyeing; 7 228.
Tartaric Acid, 7 228; crystals, 3-4 illus.
Tartarin. Comte hero in Daudet's books *Tartarin of Tarascon*, *Tartarin on the Alps* and *Port Tarascon*; 3 53.
Tartaro. Riv. of Italy, tributary of the Po, 104 m. long, 1 21.
Tartar (or Tatar) Republic. Autonomous republic of the R.S.F.S.R., consisting of a great part of Kazan prov. and portions of Ufa, Samara, Simbirsk, and Vyatka provs.; area 25,950 sq. m.; pop. 2,500,000; cap. Kazan; 7-228.
Tartars. Group of cent. Asiatic tribes, 7 228.
Tartarus. In Gk. myth. place of punishment in the underworld, 7 370.
Tartary. Old name for cent. Asia, 7-228.
Tartuffe. Comedy by Molière, 5 222. The chief character, Tartuffe, is an arch-hypocrite.
Tashi Lama. The head of spiritual affairs in Tibet, 7 273.
Tashkent. Cap. of Uzbekistan; pop. 585,000; mfrs. inc. cotton, chemicals, machinery, 6 479, 6 472, 1 266.
Tasman, Abel Janszoon (c. 1602-59). Greatest of Dutch navigators; explorations in Pacific, 6 29; discovery of New Zealand and Tasmania, 1-317, 5 380, 5 425, 7-228.
Tasmania. An island state of Australian Commonwealth; area 26,215 sq. m.; pop. 291,463; 7-228; Hohpft, 1-318; discovered by Tasman, 1-317.
Tasmanian Devil. Nocturnal marsupial native to Tasmania; fierce and untamable, 7-229, 5-137.
Tasmanian Wolf. A striped wolf-like carnivorous marsupial native to Tasmania, 7-229, 5 137.
Tassets. In armour, 1-244.
Tasso, Torquato (1544-95). It. poet, his masterpiece is the epic *Gerusalemme Liberata* (Jerusalem Delivered), dealing with 1st Crusade; 4 329.
Taste. One of the senses, 7-229; and the tongue, 7-290.
Tata, Jamssetji Nasarwanji (1839-1904). Indian industrialist; his son, Sir Dorabji Jamssetji Tata (1859-1932), carried on his work and founded Tata steelworks, Bihar.
Tatar Republic. See *Tartar Republic*.
Tate, Sir Henry (1819-99). Brit. sugar merchant and art collector; founded the Tate Gallery, London, 7-229.

TAYLOR

Tate, Maurice W. (b. 1895). Eng. professional cricketer of all round talent; during 1921-30 played in every test match against Australia; fast-medium bowler, who took 34 wickets in one series of tests, v. Australia, 1921-25.
Tate, Nahum (1652-1715). Brit. poet and playwright; b. Dublin, adapted plays, e.g. *King Lear*, to which he gave a happy ending; Poet Laureate 1692; 6 232.
Tate Gallery, London, 7-229, 5-27.
Tatler, The. Eng. journal founded by Sir Richard Steele (1709), 1 26, 7-154.
Tatra [tat'rah] Mts. Central and loftiest group of Carpathians, on border between Poland and Czechoslovakia; highest pt., 8,337 ft.
Tattenham Corner. Part of Epsom Downs race-course, 3-76 illus.
Tattoo, Military. Display or pageant, performed, usually at night, to a musical accompaniment.
Tattooing, 7 230.
Tau, τ . (Rom. t. T). 19th letter of Greek alphabet.
Tauber [taw'ber], Richard (1893-1948). Austrian-born tenor; first appeared in England in 1931 in *The Land of Smiles*; films include *Blossom Time*; became Brit. subject 1940.
Tauchenitz [taw'khaitz]. C. Bernhard (1816-95). Ger. publisher; in 1841 he began the famous "Tauchnitz edition" of Brit. and Amer. authors, for Continental circulation.
Taunton. Town of Somerset, Eng.; pop. 33,613; here Monmouth ass. signed title of king, Jeffries held Bloody Assizes; 7 81; Blake's defence, 1 181.
Taupo, Lake. In North Isl., New Zealand; area 238 sq. m.; Taupo tn. on N. shore is a health resort, with medicinal springs, 5 122.
Taurus or the Bull. Constellation, 2 190 diag.; sign of the Zodiac, 7 524 illus.
Taurus Mts. Series of ranges in Asia Minor, extending w. from Euphrates; highest peaks over 10,000 ft.; N.E. extension called Anti-Taurus.
Tavernier, Jean Baptiste (1605-1689). Fr. traveller, pioneer of trade, and linguist; and Gt. Mogul diamond, 3 81.
Tawaf. Ceremony performed by Mahomedan pilgrims at Mecca, 5-156.
Tawing. A tanning material used for producing white leathers.
Tawny Owl. Brit. owl, 6-12, 6-frontis; foot, 1 471 illus.
Tawny Pipit, bird, 6 205.
Taxation, 7 230; customs duty, 3 12; Parliament and, 4 51; salt tax, 6 491; on spirits and alcoholic liquors, 1-96, 7 137.
Taxicab, orders by radio, 6 351 illus.
Taxidermy. Art of preserving and mounting animal specimens.
Taximeter. Automatic device for working out the fare due from a hire of a taxicab, invented by Lazaro Weiller (d. 1928).
Taxonomy. The classification and arrangement of living creatures in natural groups, 1-451, 2-24, 7 527.
Tay. Largest r. of Scot.; rises near borders of Perthshire and Argyllshire, flows E. 117 m., expanding into estuary at Firth of Tay, 6-138, 6-510.
Tay, Loch, Scot. Lake in w. Perthshire; 14 m. long and about 1 m. broad, 6 138, 6 510.
Tay Bridge. Rly. bridge crossing Firth of Tay, Scot., completed 1887; it replaced an earlier bridge opened 1878, which collapsed in Dec. 1879 when a passenger train was crossing; all passengers (about 90) lost their lives, 6-357, 3-135.
Taylor, Jeremy (1813-67). Eng. clergyman and author, called for his golden eloquence and rich fancy, the "Eng. Chrysostom" (*Holy Living*; *Holy Dying*—popular devotional manuals).
Taylor, John Henry (b. 1871). Brit. golfer; open champion 1895, 1896, 1900, 1909, and 1913. With Vardon and Braid ranks as one of greatest names in professional golf, 4-44.

TAYLOR

Taylor, Sir Robert (1714-88). Brit. architect; additions to Bank of England, 1-362.

Taylor, Zachary (1784-1850). 12th pres. of U.S.A. (1848); he spent much of his life fighting against the Indians.

Tbilisi (formerly Tiflis). Cap. of Soviet rep. of Georgia at S. base of Caucasus Mts., between Black and Caspian seas; distributing centre for Transcaucasia; pop. 519,100, 3-524.

Tchaikovsky, Piotr Ilyich (1840-93). Russ. composer, 7-231, 3-306, 5-515.

Tshekhov, Anton P. See Chekhov.

Tea, 7-232; tea gardens in Assam, 4-240, 244 illus., 4-276; (China) tea-garden, 2-375 illus.; Darjeeling plantation, 4-244 illus.; processing, 1-270 illus.; flavoured with jasmine, 4-355; in Japan, 4-343 illus.

Tea, Afternoon meal; in Eng., 5-151.

Teaching, as career, 2-240; tutorial system at Oxford and Cambridge 7-368. See also School.

Teak. Timber tree, 7-235.

Teal. Breed of duck, 3-133, 131 illus.; migration, 5-201 illus. f.

Teasel. A biennial plant with prickly flower-heads, 7-235, 236 illus.

Teaselling, of woollen fabric, 7-475.

Teazie, Sir Peter. In Sheridan's *The School for Scandal*, a testy but good-natured old man, jealous of his pretty young wife, 7-26.

Tellurium or Telectum (Te). Chem. element; atomic no. 52; atomic weight 99; 3-224.

Tesumash (tekum'sh) (1768-1813). Shawnee Indian chief. In 1801 he originated a scheme whereby Indians might unite to wipe out the whites; he became a brigadier-general in the British army, leading the Indians in the War of 1812.

Tedder, Marshal of R.A.F. Arthur W. Tedder, Baron (b. 1890). Brit. air officer; as A.O.C.-in-C. of R.A.F. in Middle East, 1941-43, organized air offensive supporting 8th army in N. Africa; marshal of R.A.F. 1945; chf. of air staff 1946-50; chanc. of Cambridge Univ. in 1951.

Teddington. Thames riverside dist., in Twickenham, Middx.; where tidal waters end; National Physical Laboratory was established here in 1902.

Teddy Bear. Child's toy, 3-104.

Teey in golf, 4-46.

Tees. R. of N. Eng. rising in Cumberland, flowing along S. boundary of Durham to North Sea, 3-139.

Teeth, 7-236; amalgam fillings, 1-116; in ape and Man, 1-180; and digestive process, 3-89; foods necessary for, 3-409; and general infection, 4-15; of horse, 4-196; hygiene and care of, 4-223; in mammals, 5-102; in ruminants, 6-471.

Tegaea (tē'gā), Greece. Anc. city in Arcadia; ruins with Sparta, subdued about 550 B.C.; excavations on site of temple of Athena.

Tehuacalpa (tē'huacal'pā). Cap and chief city of Honduras; pop. 92,950; old Aztec city, 4-190.

Teguxia. Lizard, 4-528.

Teheran (tay'hērān'). Cap. of Persia in prov. of Teheran; pop. 1,010,000; large caravan trade; at conference held there during 2nd World War Churchill handed to Stalin the Stalin-Grad sword of honour, 6-134, 7-142.

Tehuantepec (tē'wahn'tāpek). Mexico. City in state of Oaxaca, 18 m. from Pacific; pop. 12,300; oil field.

Tehuantepec, Isthmus of. Narrowest part of Mexico, between Gulf of Campeche and Gulf of Tehuantepec.

Tehuelche Indians. People of Patagonia S. America, 5-96.

Telf. R. of S. Wales, flowing 50 m. to Cardigan Bay, 2-221.

Telg. R. in Devon, Eng. flowing to English Channel; 30 m. long.

Telich. R. of Perthshire, Scot., source near Loch Lomond; flows to r. Forth, 6-138.

Tel Aviv-Jaffa. Spt. of Israel on Mediterranean; pop. 300,000; exports wool, wine, oil, sesame, and Jaffa oranges; in 1949 Tel Aviv was amalgamated with Jaffa.

Telecommunication, 7-241-241.

Telegraph plant, 4-470.

Telegraph Plateau. Submarine plateau of N. Atlantic along which telegraph cables are laid, 2-154, 1-292.

Telegraphy, 7-237; cables, 2-152; Lodge and, 5-14; Marconi and, 6-312, 5-122, 313; Morse, 5-267.

Tel-el-Amarna. Egypt; archaeological discoveries, 1-205, 3-199.

Tel-el-Kabir, Battle of (1882). Victory in Egypt by a Brit. force over Sir Garnet Wolseley over an Eg. force under Arabi Pasha, 3-176.

Telemachus (telem'akus). In Homer's *Odyssey*; son of Odysseus and Penelope, 5-503.

Telemeter. Apparatus for recording a physical event which is taking place at a distance. It is used in electrical work to give remote indication of quantities, e.g. voltage, current, power, etc.; in surveying and gunnery to act as a distance measurer; in photography as a range-finder; and in guided missiles to distribute the information which, radiated by the controller, guides the missile to its objective.

Telepathy. The power to transmit ideas from one person to another, even at a great distance, without using the ordinary channels of sense; among Scott Lupp, 4-417.

Telephone, 7-240; automatic, 7-245, 244, 246 illus.; carbon microphone, 5-193; Graham Bell and, 1-423; submarine cables, 2-154, 7-240; two way service between London and New York, 6-340; and television, 7-254 illus.

Teleprinter, 7-239, 238 illus.

Telescope, 7-248; early designers of, 1-278; astronomical, 5-493, 7-145; Galileo's, 3-189; lens, 4-440; mirrors for, 5-225, Newton's, 5-409 illus.

Telescope Fish, 4-42.

Teletypesetter. In printing, 4-519.

Television, 7-251; Coronation televised, 2-510; fluorescence, 6-162; make-up for, 5-91; photo-cell, 6-169; transformers, 7-307, 308; underwater television, 5-351 illus.

Telford, Thomas (1757-1834). Scot. engineer; builder of roads and canals, 4-255; road foundations, 6-107.

Tell, William. Legendary Swiss hero, 7-255, 7-213.

Tell, The. Fertile coastal plain in Algeria, 1-109.

Tellurium (Te). Chem. element, atomic no. 52; atomic weight 127.61; melts at 452°C.; 7-255, 3-224.

Tellurium lead, 4-463.

Telugu. Dialect of India, spoken by some 23 million mostly in Andhra, N. Madras and Hyderabad, 4-231.

Teme. R. of Eng. and Wales; flows 60 m. to join the Severn, 7-41, 4-168.

Téméraire. Fr. warship; at Trafalgar, 7-305.

Temme, Edward H. Brit. swimmer; the first man to swim Channel both ways, 7-210.

Tempelhof. Airport of Berlin, and among the largest airports of Europe; near the centre of the city.

Tempéra. Painting medium used by early It. painters, 6-36.

Temperance, and alcohol, 1-96.

Temperature, of air, 1-80, 81; record low in Antarctic and Siberia, 1-164; body and blood, 1-491; compensation in chronometers, 2-384; distinguished from quantity of heat, 4-146; effects on gases, 3-503; variations at different heights, 7-172 illus.; factors determining land temperature, 2-409; low temperature and absolute zero, 3-465; measurement, 4-148; in mines, 5-218; on moon, 5-257; attained in oxy-acetylene torch, 1-10; at Shanghai, 7-15; in stratosphere, 5-180; thermometer, 7-268.

Tempering, of steel, 4-293.

Tempest, Dame Marie (1866-1942). Brit. actress of great versatility, celebrated her jubilee on the stage in 1935; created D.B.E. in 1937.

TENSOR CALCULUS

Tempest, The. Comedy by Shakespeare, 7-258.

Templars. See Knights Templars.

Template, or **Templet**, in engineering, a thin plate of metal or wood cut to the shape or outline required of a finished part or object, by which the surface is marked off or gauged during machining or other operations. In building, the support for the end of a beam.

Temple of Diana at Ephesus, 7-1; in India, 4-245, 246 illus.; Solomon's temple at Jerusalem, 7-84.

Temple, The, London; property of the Knights Templars 1154-1313; from 1608 has belonged to the two inns of court named Inner Temple and Middle Temple, 5-21, 4-418, 1-377.

Temple Bar, London; the boundary point between Fleet St. (City of London) and the Strand (Westminster) marked until 1878-79 by a gateway designed by Wren and recreated at Thornhill's Park, near Waltham Cross; ceremonial entry of sovereign, 6-21.

Temple Church, London; and Knights Templars, 5-21, 4-418.

Temple Newsam. Historic mansion at Leeds, Eng., now used as art gallery, 4-175.

Templer, Sir Gerald Walter Robert (b. 1898). Brit. soldier; served as c.-in-c. Malaya 1952-54 to deal with communist-inspired bandits, 5-97; appointed C.I.B.S. 1955.

Tempo. See Musical Terms (list).

Tenants-in-chief, in feudal system 3-314.

Tenby. Seaside resort and spt on Carmarthen Bay, Pembrokeshire, pop. 4,597, 6-111.

Tench. A coarse fish, native to Asia Minor and Europe; bait for, 3-384, 6-104.

Ten Commandments, influence on mankind, 5-270.

Tender, of locomotive, 5-1.

Tenderfoot. Raw recruit in Boy Scouts, 2-43.

Tendon of Achilles. In anatomy; origin of term, 1-11.

Tenerife. Largest of the Canary Islands, 782 sq. m.; pop. 401,283; chief tn. and spt. Santa Cruz de Tenerife, 2-208.

Teniers (ten'yērs'), David (1610-90) the Younger. Noted genre painter of Flemish school; son of David Teniers the Elder (1582-1619), also an important Flemish painter, 5-352. The Watch, 5-390 illus.

Tennessee. A state of U.S.A.; area 42,246 sq. m.; pop. 3,291,718; cap. Nashville; 7-256.

Tennessee River. Largest tributary of Ohio R. 800 m. long, 7-256.

Tennessee Valley Authority (T.V.A.) Organization estab. 1933 to develop Tennessee Valley by providing irrigation and water power over a wide area, 7-256.

Tenniel (ten'yel'), Sir John (1820-1914). Brit. political cartoonist, on staff of *Punch* for 50 years; original illustrator of *Alice's Adventures in Wonderland*, 2-252-255; Dropping the Pilot, 1-474 illus.; John Bull, 4-375 illus.

Tennis (real, or royal), 7-256, 257 illus.

Tennis (lawn). See Lawn Tennis.

Tennis Court, Oath of the. Taken June 20, 1789 by Fr. National Assembly, 3-467.

Tenno. Jap. name for the emperor, the term Mikado is used only by foreigners, 4-348; power restored in Japan, 4-340.

Tennyson, Alfred Tennyson, 1st Baron (1809-92). Brit. poet, 7-257; compared with Browning, 3-290, on *Sordello*, 2-95; poet laureate, 6-232; home in Isle of Wight, 7-450.

Tenochtitlan. Anc. city, cap. of the Aztecs; site now Mexico City, 1-331, 333; captured by Cortés, 2-513.

Tenor, in singing, 7-57.

Tense, in grammar, 7-390.

Tensing. Sherpa guide who, with Edmund Hillary, reached summit of Everest, May 29, 1953; 3-321.

Tensor Calculus, in maths., 5-149.

TENT

Tent. Pitching a tent, 2-193.
Teotihuacan. Anc. Mex. city; Pyramid of the Sun, 1-333, 339 illus.
Terbium (Tb). Chem. element; atomic no. 65; atomic weight 159.2; 7-259, 2-224.
Terborch, Gerard (1617-81). Dutch painter, 5-394.
Teres. Canonical hour of prayer in R.C. Church, 5-244.
Terceira. Isl. of the Azores; cap. Angra do Heroismo; area 322 sq. m.; chief products wine and fruit, 1-330.
Terebella. A sea-worm, 7-500.
Terobinth. A tree of the genus *Pistacia*, which also includes pistachio nut; resembles the ash; original source of turpentine.
Tere do or Shipworm. A crustacean or worm-like mollusc which bores into wood, causing extensive damage to piles and submarine cables, 2-155.
Terence (Publius Terentius Afer) (c. 194-159 B.C.). Rom. dramatist, of African blood, b. Carthage, Africa, 4-430, 3-116, 118 illus.; chief works, *Andria*, *Hiccuphormenomenos* (The Self-Tormentor), *Phormio*.
Teresa (tără zah), St. (1515-82). Sp. nun; famous mystic, 2nd patron saint of Sp. monarchy and founder of the Barefooted Carmelites.
Termites or White Ants, 7-259, 1-163; nest, 1-60 illus. f.
Termini (anc. Interamna). It. mfg. city; pop. 68,890; near famous falls of Terni; govt. arsenal, iron, steel, textile mfrs.; Neapolitans defeated by Fr. 1798.
Terns. Sea birds of the family *Laridae*, 7-260, 1-466 illus.
Terpsichore (tēpsik'orē). In Gk. myth., Muse of dancing, 5-899.
Terracina (terachēna) (Lat. Tarracina). It. historic tn.; pop. 8,000; remains of anc. forum and temple.
Terra-cotta. Unglazed earthenware of a reddish-yellow colour.
Terra Nova. Wooden whaling-vestel in which Capt. Scott sailed to North Pole in 1910, 6-515, 6-215 illus., 1-165 illus.
Terrapin. A water-tortoise, 7-290.
Terriers. Breeds of dog, 3-102; as ratlers, 6-365.
Territorial Army. Brit. military organization of citizen soldiers, formed in 1920 from the Territorial Force (1907); reorganized in 1947; in addition to other duties, has entire charge of Britain's anti-aircraft and coastal defences, 1-248. The T.A. is one of the formations in which a National Serviceman may do his four years' compulsory part-time service after his full-time service in the Regular Army, 1-248.
Territorial Efficiency Decoration (T.E.D.). Founded 1930, awarded for twenty years' efficient commissioned service in the Territorial Army.
Territorial Waters, in international law, 4-459.
Ter River. River of Spain. Rises in N.E. Pyrenees, flows E. and E. 110 m., entering Mediterranean by several mouths S. of the Gulf of Rosas.
Terry, Dame Ellen (1847-1928). Brit. Shakespearean actress, long associated with Sir Henry Irving; she had few rivals in the grace and intellectual grasp with which she portrayed characters such as Portia, Lady Macbeth, Desdemona, and Cordelia.
Tertiary System, in geology, 3-516.
Tertullian (A.D. c. 155-c. 230). One of great fathers of the Latin Church, b. Carthage, called creator of Christian Latin literature.
"Terylene." A synthetic fibre, 6-369.
Test, River of Hants; flows almost due S. into Southampton Water, length 32 m.
Testator. The maker of a will, 7-450.
Test Match. International cricket match, 2-331.
Testudo (Lat. tortoise). Military formation in anc. Roman army in which soldiers held shields over their heads and overlapped shields of those in rear.

Tetany. A disease; and parathyroid glands, 4-28.
Teton Mts. A range of the Rocky Mts. in N.W. Wyoming, U.S.A.
Tetrahedron. A solid figure bounded by four triangles, i.e. a triangular pyramid. In a regular tetrahedron all four sides are equilateral triangles and all six edges are equal.
Tetrameter, line in poetry, 6-234.
Tetrazzini (tetrazz'ni), Luisa (1874-1940). It. coloratura soprano (famous roles in *La Traviata*; *Rigoletto*; *Lucia di Lammermoor*).
Tettigoniidae. Family of insects, 4-66.
Tetuan. Tn. of Spain, Morocco; pop. 94,000.
Teizel, John (c. 1455-1519). Dominican monk, and Luther, 5-53.
Teutoburger Wald. Forest covering series of hills in Ger. extending 70 m. from N.W. to S.E. Scene of the "route of Varus," Rom. general, by Ger. troops under Arminius, A.D. 9. See Hermann.
Teutonic Knights, Order of. Order of knighthood, founded 1193, confined to Germans of noble birth; converted and conquered old Prussia; ruled extensive dists. on borders of Poland and Russia, 4-7; and Danzig, 3-49; and Latvia, 4-463; in Prussia, 6-298, 3-314.
Teutonic Languages, 4-445; sources of Eng. speech, 3-281.
Teutons. Germanic people, 7-260, 3-313; invasions into Rom. empire, 5-198, 4-5.
Teviot. R. of Scot. in Roxburghshire 37 m. long, 6-460.
Teviotdale. Alternative name for Roxburghshire, Scot., 6-460.
Tewfik Pasha, Mohammed (1852-1892). Eg. ruler, succeeded as Khedive in 1879, but was deposed after revolt of Arabi Pasha in 1882, when the British took over, 3-176.
Tewkesbury. Historic tn. in N. Gloucestershire on the Avon; pop. 5,292; remains of famous Benedictine abbey, Yorkists defeated Lancastrians (1471) in Wars of the Roses, 6-454.
Texas. A state in S.W. U.S.A., largest, in the Union; area 267,339 sq. m.; pop. 7,711,191, 7-260, 5-188.
Textiles; bleaching, 1-483; cells of textile fibres, 2-287; cloth, 2-418; cotton, 2-516; dyeing and printing, 3-141; Jacquard loom, 4-335; lace, 4-429; linen, 4-514; loom, 5-36; nylon, 5-487; rayon, 6-368; silk, 7-53; spinning, 7-135; weaving, 7-133; wool, 7-173.
Thackeray, William Makepeace (1811-63). Brit. novelist, 7-260, 201 illus., 5-472, 3-291; *The Rose and the Ring*, 2-354; on Brighton, 2-71.
Thailand. See Siam.
Thales (thāl'ez) of Miletus (c. 610-c. 550 B.C.). Gk. philosopher, one of the "seven wise men," 6-160; discovered static electric properties of rubbed amber; regarded water as primal substance, 1-95.
Thalia. In Gk. myth., Muse, of comedy, 5-299.
Thallium (Tl). Chem. element; atomic no. 81; atomic weight 204.39; melting point 303° C.; 7-261, 3-224.
Thallophyta. Group of plants including bacteria, algae, fungi, 6-214, 2-24.
Thame. Tn. in Oxfordshire, Eng.; pop. 3,585; has annual fair and agricultural show; cattle market, 6-22 illus.
Thame (tānu). River in Bucks and Oxon, trib. of Thames; 30 m. long.
Thames. Riv. of Eng., about 215 m. long, 7-261, 262 illus.; Bankside in 1616, 7-13 illus.; at London, 5-20; oyster beds, 6-23; river police, 6-250 illus.; swan-upping, 7-190 illus.; tunnels under, 7-325, 326.
Thames. Riv. in Ontario, Canada, 180 m. long, flowing into L. St. Clair.
Thames Conservancy Board. Controls traffic, etc., in the Thames between Teddington Lock and Lechlade, 7-263.
Thames Division. Official name for Metropolitan Police patrolling riv. Thames; launch, 4-250 illus.

THERMIONIC VALVE

Thanet, Isle of. Dist. of N.E. Kent; up to 16th cent. was an isl. divided from rest of country by R. Stour and a much larger r. the Wantsumme, now silted up; collieries, 4-398.
Tharshis. Tn. in Spain, said to be the Biblical Tarshish; ancient mine, 5-215.
Thasos. Gk. isl. in N. Aegean, off coast of Thrace; pop. 8,000.
Thatching, in E. Africa, 1-54 illus.
Thayer, Abbott (1818-1921). Amer. artist known for his landscapes and portraits; and camouflage, 2-191.
Theatre, 7-263; and circus dialogue, 2-101; Globe Theatre, 3-119 illus.; (Greek, 4-93 illus.; at Oberammergau, 5-492 illus.; pantomime and baroque, 4-133; puppets, 6-310; 18th and 19th cent. scenery, 3-120 illus.; stage make-up, 5-91. See also Drama.
Theatre Royal, Bristol. Opened 1766. Oldest existing theatre in England, 2-71.
Theatre Royal, Drury Lane, London. Sheridan, and 7-26.
Thebaine. Drug contained in opium 5-521.
Thebes. Anc. city and cap. of Upper Egypt; site now of Luxor, Karnak and Medinet-Habtu; temple at Ammon, 3-196 illus., 7-267.
Thebes. City of anc. Greece, 7-266; war with Sparta, 7-124; raised by Alexander the Gt., 1-98; and riddle of the Sphinx, 7-131.
Thessa (thē). R. of S.E. Europe; rises in Carpathian Mts.; flows E. with many windings 870 m.
Thesis. See Musical Terms (list).
Them'is. In Gk. myth., one of the Titans, goddess of eternal law and order; by Zeus she became mother of the Hours and the Fates; in art she is usually pictured with cornucopia and scales.
Themistocles (thēmis'toklēz) (c. 514-449 B.C.). A great Athenian general and statesman; and Aristides, 1-227; 4-76; long walls at Athens, 1-287.
Theophrastus (thēof'rastus) (3rd cent. B.C.). First and greatest of Gk. pastoral poets, 4-94.
Theodolite. An instrument for measuring angles, used in surveying, 7-196.
Theodora (d. A.D. 547). Wife of the Byzantine emperor Justinian, 1; originally dancer and actress; harsh and cruel, but able ruler; 2-148, 150; mosaic portrait, 5-269 illus., 4-317.
Theodore III (1815-68). Emperor of Abyssinia; succeeded his uncle as chief of Kwara and after many conquests was proclaimed emperor in 1855; 1-7.
Theodoris (thēof'orik) the Great (c. 454-620). King of the Ostrogoths, greatest Gothic ruler; in Ger. legend became the hero Dietrich of Bern; 4-306, 4-40; tomb at Ravenna, 6-368.
Theodoris I (418-451). King of the Visigoths; and Attila, 1-309.
Theodosia (Crimea). See Feodosia.
Theodosius the Great (346-395). Rom. emperor, succeeded 379; conquered frontier barbarians; prohibited heathen worship; recognized orthodox Catholicism; 5-198, 4-49.
Theodosius II (401-50). E. Rom. emperor, associated with code of laws *Code Theodosianus*; and Attila, 1-306.
Theophrastus (c. 372-288 B.C.). Gk. philosopher, successor of Aristotle as head of Peripatetic School, 2-24.
Theotocopoul, Domenico. See Greco, El.
Therapeutics (therapēut'iks), or Therapy. Part of medical science which relates to treatment and remedies for disease. See Medicine.
Therm. In U.K., statutory and commercial unit of quantity of heat, used for measuring consumption of coal gas. It is equal to 100,000 British Thermal Units, 4-146 148; 5-194.
Thermionic Valve, and radio transmission, 7-378 diag.; and television, 7-252.

THERMIT

Thermit or Thermita. A metallic mixture, used in welding, and sometimes in the preparation of metals such as the rare-earth metals.

Thermocouple. Instrument for measuring temperature. Consists of two wires of different metals joined at each end. One junction is at the point where the temperature is to be measured and the other is kept at a lower fixed temperature. The difference of temperature at the junctions generates a thermo-electric e.m.f., which causes a current to flow in the circuit. The strength of the current is measured by a galvanometer and the value of the current gives the heat in degrees.

Thermodynamics. Branch of the study of heat and the principles underlying the action of all heat engines. 4 118; and chemistry, 2 324; Kelvin's work on, 4 396.

Thermo-electricity, 3 214.

Thermograph. A continuous-reading temperature-recording instrument used in meteorology. 7 268.

Thermometer, 7 267; deep-sea, 5-195 illus.; mercury in, 5 174; temperature measurement, 4 118.

Thermopile. Instrument for detecting and measuring heat radiations, 3 41.

Thermoplastics, types, 6 219.

Thermopylae, Battle of (480 B.C.). Spartan stand against the Persians, 6 130.

Thermosetting Plastics, 6 219.

Thermostat. Instrument for maintaining a constant temperature from a heat source by cutting off the supply of heat when the required temperature is exceeded and restoring it when the temperature falls below a specified level. Consists of a metal which expands and contracts readily to changing temperature conditions, linked to a switch or other device controlling the heat source, 7 268.

Thersites [thers'fēz]. In Homer's *Iliad*, the one ugly, hateful, slanderous braggart among the Greeks before Troy.

Thes'um. Temple of Vulcan at Athens, 1 287.

Theseus. Gk. legendary hero, slayer of the Minotaur, 7 268; and the Amazons, 1 130; battle against the centaurs, 2 291.

Thesmophoria. In anc. Greece, festival of goddess Demeter, 3 60.

Thespis (c. 530 B.C.). Gk. poet, regarded as originator of tragedy and first to introduce actors (as well as choros), 3 116.

Thessalonians, Epistles to the, in New Testament, two of St. Paul's epistles dealing with second coming of Christ.

Thessaloniki. Anc. name revived by Greeks in 1937 for the Aegean Sp. called Salonika.

Thes'saly. Dist. in Greece, s. of Macedonia; largest division of anc. Greece; horse breeding and centaur legend, 2 291.

Theta, θ, Θ (Rom. th, Th). 8th letter of Gk. alphabet.

Thetford. Old tn. in Norfolk; pop. 4,943; Castle Hill, anc. mound, 1,000 ft. in circumference and 100 ft. high; near by is Thetford Chase, state forest of 11,000 acres; 5 118.

Thetford Mines, Quebec. Tn. 55 m. s. of Quebec; pop. 15,095; extensive asbestos mines.

Thetis. In Gk. myth., a Nereid, and mother of Achilles, 5-188, 1-10; marriage feast, 7 320.

Thiers (tyär). Louise Adolphe (1797-1877). Fr. statesman and historian, 1st pres. (1871-73) of 3rd Repub. after the Franco-Prussian war, 3 459.

Thigh-bone, and growth in Man, 1-518.

Thimmonpieri, Barthélemy (1793-1859). Fr. tailor who invented a chain-stitch sewing machine, 7 9.

Third Coalition. In Napoleonic Wars, 5-320.

Third Estate. In pre-revolutionary Fr., main body of people, 3-152; Matabeau as leader, 3-166 illus., 467, 5-224. *See Estates-General.*

Third International. Extreme Socialist organization in Russia that at-

tempted to unite all Communists of the world; dissolved 1913.

Third Reich [rīkh]. Ger. state under Hitler régime, 1932-45, 4-10-11; 7-185-196. *See also Hitler; National Socialism.*

Third Republic (1871-1910). In Fr. hist., 3-453.

Thirlmere. Lake in Cumberland, supplies water to Manchester, 4-439.

Thirty-Nine Articles. The (1576) Official statement of faith of Church of Eng., 2 381, 386.

Thirty Years' War (1618-1648), 7 269, 4 8; Richelieu and increased power of Fr., 6 100.

Thistle, 7 270; seeds, 6 524.

Thistle, Order of the, 5 330, 4 118.

Thomas, St. One of Twelve Apostles, 1 181.

Thomas (à Kempis). *See A Kempis.*

Thomas, Bertram Sidney (1892-1950). British explorer in Arabia, 1-196.

Thomas, Dylen (Marlais) (1911-53). Welsh poet and story writer. (*Deaths and Entrances, A Portrait of the Artist as a Young Man, Under Milk Wood*—verse drama for radio), 7-415.

Thomas (Phillip) Edward (1878-1917). Brit. poet, died fighting in France in 1917 ("The Woodland Life"; "Horae Solitariae"; "Rest and Unrest"; "Light and Twilight"; "Poems"; and "Last Poems").

Thomas the Rhymor (c. 1220-97). Scot. poet, also known as Thomas of Errol; made many prophetic statements, 6 511.

Thompson, Francis (1860-1907). Brit. poet and mystic; author of *The Hound of Heaven*, intensely beautiful religious lyric, 3 291.

Thompson Sub-machine gun, popularly called Tommy gun. Automatic rifle, weighing 11 lb. 6 oz. with 124 in. barrel, 45 in. calibre; invented in 1921 by J. T. Thompson, a Chicago police officer.

Thoms, William John (1803-85). Brit. antiquary; coinage of term folk lore, 3 105.

Thomson, Sir George Paget (b. 1892). Brit. physicist, prof. of physics, Imp. Coll. of Science, 1930-52; master of Corpus Christi College, Cambridge, from 1952; received Nobel prize for physics 1937, for discovery of interference phenomena in irradiation of crystals by electrons.

Thomson, James (1700-18). Scot. poet, pioneer of romantic movement in Eng. literature (*The Seasons; Rule Britannia*), 6 511.

Thomson, James (1834-82). Brit. poet and journalist; profoundly melancholy and pessimistic (*The City of Dreadful Night*).

Thomson, Sir John Arthur (1861-1933). Brit. zoologist, author of many interesting works, editor of *The Outline of Science*.

Thomson, Sir Joseph John (1856-1940). Brit. physicist; O.M. 1912, developed electron theory, 3 221, 1-297.

Thompson, Robert William (1822-73). British inventor; and first pneumatic tyre, 6-466.

Thomson Effect. The electromotive force produced by temperature differences in a single conductor, and the heat change associated with current flow between temperature differences. Called after William Thomson, 1st Baron Kelvin (1824-1907).

Thongweed. Type of brown seaweed, 1 104 with illus. f.

Thor. Norse god of thunder, 7-270; gives name to Thursday, 3-55.

Thoracic Duct, and lymphatic system, 1-490.

Thoracic Surgery, of lungs and heart, 7-195.

Thorax. Part of the body between head or neck and the abdomen.

Thoreau, Henry David (1817-62). Amer. naturalist and writer. Lived in a solitary hut on shores of Walden Pond, nr. Concord, Mass. His experiences of animal life were described in his book *Walden* (1854), 7-264.

Thorium (Th). Chem. element; atomic no. 90; atomic weight 232.12; 3-224; radio-active properties, 6-351.

THUGS

Thorn Apple. Poisonous plant (*Datura stramonium*), of fam. *Solanaceae*, 6-237 illus.

Thornback Ray. Fish, 7 59.

Thornbidge, Dame Sybil (b. 1882). Brit. actress; notable success in *Saint Joan*; D.B.K. (1931).

Thornhill, Sir James (1675-1734). Eng. painter; animals at Greenwich Hospital; and in St. Paul's, 3-273.

Thornycroft, Sir John Isaac (1815-1928). Brit. engineer; builder of internal-combustion engines for road vehicles, also high speed launches and torpedo craft.

Thornycroft, Sir Hamo (1850-1925). Brit. sculptor; King Alfred statue, 1 103 illus.

Thorvaldsen, Bertel (1770-1844). Dan. sculptor, 6 521.

Toth [tōt]. Egyptian god of wisdom; identified by Greeks with Hermes, 3-199.

Tothmes I. Egyptian pharaoh (reigned c. 1539-1511 B.C.), 3 198.

Tothmes III (c. 1501-1447 B.C.). Eg. pharaoh, "the Napoleon of Egypt." Sole ruler after death of Hatshepsut, conquests, 3-199, and Cleopatra's Needle, 2-408.

Thousand and One Nights, The. *See Arabian Nights.*

Thrace. In anc. geography, a country in E. of mod. Balkan peninsula. Most flourishing period, 5th-4th cents. B.C., under Turkish rule (1453-1878). Bulgaria obtained s. half by Treaty of Berlin in 1878, the s.w. section in 1913. In 1919 whole was assigned to Greece, but in 1923 Turkey was given E. Thrace.

Thrale, Henry (1728-81). Brit. brewer, husband of Hester Thrale (1741-1821), friend of Dr. Johnson, 4 380.

Thrale, Hester (1741-1821). Wife of Henry Thrale (*see above*), a brewer, after his death married an Italian musician named Pizzoli; wrote delightful letters and was central figure of a literary and artistic circle; friend of Dr. Johnson, 4 380 illus.

Thread, 7 173.

Threadneedle Street, London, Bank of England, 1 362.

Three Choirs Festival, The. Yearly musical festival held in the cathedrals of Gloucester, Worcester, and Hereford in turn.

Three-dimensional Films, popularly called 3-D, 7 156.

Three Musketeers, The (1844). Novel by Dumas, and its sequels, 3 133.

Threepenny Piece. Brit. coin, 5 233 illus. f.; Irish coin, 4-285 illus.

Three-phase Current (electricity), 3-213 with diag.

Three Rivers, Quebec. Port on St. Lawrence and St. Maurice rivers, pop. 46,071; exports lumber, grain, cattle; wood, paper, and pulp industries; founded in 1634.

Three-toed Woodpecker, foot, 1-171 illus.

Threshing [thrash'ing]. Agric. process by which grain is separated from the ears in crops.

Thrift, or Sea Pink, perennial herb, popular for borders and rock gardens.

Throgmorton Street, London; Stock Exchange, 5-20.

Thrombokinas. Enzyme which causes blood to clot; produced by platelets, 1-190.

Thrombosis. Clot of blood formed in blood-vessel, usually a vein; caused by injury, inflammation, thickening of arteries, or drop in high blood pressure.

Through the Looking-Glass. Story by Lewis Carroll, 2 251.

"Thums," in Barrie's works 1-372.

Thrush. Bird, 7-271; instinctive behaviour, 1-153 illus.; egg, 1-452 illus. f.; migration, 5-204 illus. f. song, 1-472.

Thucydides (c. 464-404 B.C.). Gk. historian, 7-271, 4-93, 4-181; and Pericles, 6-125.

Thugs. An organization of professional murderers in India who strangled their victims in honour of the goddess Kall, wife of Shiva; killed 30,000

THULE

natives a year; suppressed by Brit. govt. in 1840.

Thule [thùlè]. Northernmost point of world known to ancients, mentioned by Polybius, Tacitus and Ptolemy; variously identified as Iceland, Norway, and Shetland Isles. Modern Thule, on Baffin Bay, Greenland, a major U.S. air base completed 1952.

Thulium (Tm). Chem. element; atomic no. 69; atomic weight 168.9; 3-224.

"Thumbs up" sign, 4-26.

Thun (toon), Switzerland. Tn. on r. Aar; pop. 22,900; h.q. of the Swiss artillery.

Thun, Lake of. Lake in canton of Berne, Switzerland, w. of Interlaken, an expansion of r. Aar, 10 m. long by 2 m.

Thunderstorms, 7-169; daily world average, 4-505.

Thurber, James (b. 1894). Amer. humorous writer, 7-360.

Thuringia. State in cent. Ger. formed in 1919 by union of eight former states; with part of Saxony formed new *Land* (province) of Thuringia in 1946; area 6,021 sq. m.; pop. 2,293,000; cap. Weimar.

Thursday, 3d day of week; origin of name, 3-55, 7-271.

Thursday Island. Pearl-fishing centre in Torres Strait, 30 m. N.W. of Queensland, Australia; pop. 1,110, 6-324.

Thurso, Archibald Sinclair, Viscount (b. 1890). Brit. politician; leader of Liberal party in House of Commons 1935-45; previously (1931-32) sec. of state for Scotland; sec. for air, 1940-45.

Thurso. Tn. in Caithness, Scot.; pop. 3,203; 2-165.

Thylacine. See *Tasmanian Wolf*.

Thyme. Plant used for seasoning food, 7-272.

Thymus gland, 4-28.

Thyroid gland, 4-28.

Thyroxine. Active principle of thyroid gland; 4-28; iodine in, 4-276.

Thysanoptera (Zool.). Order of insects, 4-270.

Thysanura. An order of wingless insects.

Tiahuanaco [tiéwahnah kō]. Vil. in Bolivia 38 m. N.W. of La Paz; megaliths, 1-508.

Tian Shan Mts. Range in cent. Asia, 7-331, 4-113, 1-265 illus.

Tibbin. Chopped straw used in brick-making, 2-57.

Tiber. R. of cent. Italy, length 215 m.; rises on N. slopes of Tuscan Apennines, flows through Rome to Tyrrhenian Sea; 7-272, 6-128, 4-304.

Tiberias [ti-bēr'ias]. Tn. in Palestine on w. shore of Sea of Galilee, N.E. of Nazareth; modern Tabarija.

Tiberius (reigned A.D. 14-37). Rom. emperor, 6-137.

Tibet. Country in cent. Asia, since 1951 part of the Chinese People's Republic; area 470,000 sq. m.; pop. 3,722,000; 7-272; map, 7-273; mountains, 1-264; palace of Dalai Lama, 7-273 illus. f.; lama, 7-272 illus. f.; costume, 1-273 illus.; and origin of Scott Lapps, 4-447; yak, 1-267 illus., 7-511.

Tibia. Larger shin-bone, 1-144 diag.

Tibetina septendecim (17-year cicada), 2-387.

Tibidabo. Mt. of Spain; overlooking Barcelona; 1-680 ft., 1-367.

Tibullus (59-18 B.C.). Rom. poet; comp. with Propertius, 4-450.

Ticino [téch'è-nō]. Canton in s. Switzerland; a. 1,086 sq. m.; pop. 161,800.

Ticino. R. of Switz. and N. Italy, 150 m. long; flows into r. Po.

tick. Parasite found on sheep; sheep dipping, 6-78 illus.

"Ticker". See *Stock Exchange Terms*.

Tides, 7-274, 275 illus.; put exerted by moon, 4-67; at Southampton, 7-101.

Tidworth. Village of Wiltshire, Eng., 9 m. w. of Andover. An important military camp of the Southern Command.

Tie. See *Architectural Terms*.

Tien Shan. See *Tian Shan*.

TIRYNS

Tientsin. Spt. of China in Hopeh prov.; brick, cement, soap and tobacco mfcs.; pop. 1,718,000; 7-275, 276 illus., 6-108.

Tiepolo, Giovanni Battista (1696-1770). It. painter; one of the greatest of the later Venetian school, being especially famous for his mural decorations in the Baroque manner; 4-319.

Tiergarten, Berlin, Germany. Park with zoo, 1-433.

Tie-rods, in motor vehicle, 5-277.

Tierra del Fuego. Group of islands at s. extremity of S. Amer., 2-357, 7-96.

Tiflis. See *Tbilisi*.

Tiger, 7-276 with illus. f., 277 illus. f., 1-157 illus.; Bengal tiger, 1-267 illus.; foot, 3-113 illus.; at Whip-snade, 7-526 illus.

Tigéras. African people in Abyssinia, 1-6.

Tiger Beetle (family *Cicindelidae*) 1-412, 414; 3-113 illus.

Tiger Cowrie. A mollusc, 5-232 illus. f.

Tiger Lily. Type of lily, 4-507 illus.; pollen grain, 3-399 illus.

Tiger moth (*Arctia caja*), 2-143 illus.; caterpillar, 2-263 illus.

Tiglath-Pileser I, reigned about 1120-1105 B.C. One of the greatest Assyrian conquerors and builders; claimed to have conquered 42 countries.

Tiglath-Pileser III, reigned c. 745-727 B.C. Assyrian king, usurper, who subdued Babylonia, Syria, and Media.

Tignes Dam, Savoy, Fr. (592 ft. high), 3-29, 31 illus.

Tigranes (Tigrānēz) (about 121-55 B.C.). King of ancient Armenia, defeated by Pompey.

Tigris. R. of w. Asia, approx. 1,100 m. long, 7-277; map, 7-333; and Babylon, 1-335; Baghdad, rly. bridge, 1-316; and Euphrates, 3-306; fertile plain, 4-278, 279 illus.

Tikki-Tikki. See *Akka*.

Tilak, Bal Gangadhar (d. 1920). Indian politician and writer; and Indian Congress, 4-254.

Tilburg, Netherlands. Mfg. tn, 38 m. S.E. of Rotterdam; pop. 121,315; textiles, leather, iron products; 5-370.

Tilbury Docks, Essex, 23 m. S.E. of London; extensive docks with water frontage of more than 3 m., used by P. & O. and many other liners.

Tilden, William Tatem (1893-1953). Amer. lawn-tennis player; won many championships between 1920 and 1930 and later turned professional, 4-162.

Tiles, 2-60.

Tillett, Benjamin (1860-1913). Brit. politician and labour leader; M.P. 1917-21 and 1929-31; sec. of the Dock, Wharf, Riverside, and General Workers' Union.

Tillotson, John Robert (1630-91). Eng. ecclesiastic, appointed Archbishop of Canterbury in 1691; his sermons, published in 3 vols., are regarded as a model for preachers and lovers of English.

Tilly [tē'yē], Johann Tserklaes, Count of (1559-1632). German soldier, head of Catholic League in Thirty Years' War, 7-270.

Tilman, Harold William (b. 1898). Brit. mountaineer and soldier; Everest expedition, 3-321.

Til'sit. City on r. Memel. Formerly in R. Prussia, incorp. in U.S.S.R., 1915; pop. 57,000; Peace of (1807), 5-322, 320.

TIM. Post-office telephone clock, 6-169.

Timber, 7-277, 3-121; green timber, 5-51; in Finland, 3-354; lumbering, 5-49; maple wood, 5-117; in Norway, 5-464; oak, 5-489; for wood pulp and papermaking, 6-63. See also names of individual trees.

Timber Wolf, 7-464 illus.

Timbuktu or Timbuctoo, Fr. Sudan; famous trading post 9 m. N. of r. Niger at edge of Sahara; pop. 6,000; 6-485; René Caillié and, 1-51.

Time, 7-277; Chinese lack of time sense, 2-365; aboard ship, 7-279; by stars, 1-285, 7-149 illus. See also *Calendar, Clocks and Watches*.

Time Lock. Type of lock, 4-536, 6-483.

Times, The. Daily newspaper pub. in London; founded in 1785 as the *Daily Universal Register*, 5-406.

Times Square, New York City, 5-412 illus.

Time Switch, 7-279.

Time Zones, 7-277, 278 illus.

Timisoara. City of w. Rumania; pop. 108,200; has suffered many sieges, especially by Hungarian insurgents in 1849; tobacco, textiles, paper, leather; 6-470.

Timor [tō'mōr]. Isl. of Malay Archipelago, easternmost and largest of Lesser Sunda Isls.; a. 12,500 sq. m.; N.E. half belongs to Portugal, S.W. half to the Republic of Indonesia.

Timothy. Disciple and assistant of St. Paul (Acts xvi. 1; xvii, 11), who addressed to him the two epistles Timothy I and 2; the first of these is a letter upon Church order meant for the Asiatic Christian communities around Ephesus, while the 2nd is a letter of counsel.

Timpani. See *Kettle-drum*.

Timur-i-Leng. See *Tamerlane*.

Tin (Sn). Chemical element; atomic no. 50; atomic weight 118.70; melts at 232°C.; 7-280, 3-224; alloys, 1-114, 116; in bronze, 2-92; in canning, 2-212; in Cornwall, 2-508; Malayan production, 5-94; mining of, 5-215.

Tinker Bell. Fairy in *Peter Pan*, 1-373.

Tipplate, production and use, 7-280, 4-295.

Tinstone (cassiterite). Ore of tin, 7-280.

Tintagel. Vil. in Cornwall; near by are the ruins of the so-called King Arthur's castle, which is actually of Norman origin (c. 1100); 2-508.

Tintern Abbey, Monmouthshire, 1-3.

Tintoretto (Tintoretto), "Little Dyer," popular name from his father's trade, of the great Venetian painter Jacopo Robusti (1518-91), 4-319, 6-386.

Tipperary. Inland co. of Munster prov., Irish Republic; area 1,613 sq. m.; pop. 136,000; co. tn. Clonmel; pop. 10,000. Highest point is Galtymore (3,015 ft.). Dairy-farming main occupation; coal, copper, and slate deposits.

Tipperary. Popular song written in 1911 by Jack Judge (d. 1938); became favourite marching song of first troops in Brit. Expeditionary Force in 1914. Later in 1st World War was rarely sung by Brit. soldiers, out of respect for memory of their predecessors.

Tippermuir, Battle of, fought in 1644 in Perthshire, Scot.; first battle between Montrose and the Covenanters.

Tippoo Sahib (c. 1753-99). Indian potentate, son of Hyder Ali, whom he succeeded as sultan of Mysore in 1782; fought Brit. invasion, but defeated and slain in his cap. of Seringapatam, 4-252.

Tirah Campaign [tirāh]. Brit. expedition organized by Sir William Lockhart against Afridis and Orakzais in Tirah Valley, on the N.W. Indian frontier (1897-98); will always be remembered for the ascent and capture of Dargai by the Gordon Highlanders.

Tirana [tērā'nah]. Cap. of Albania since 1921; pop. 30,000; 18 m. E. of Durazzo; 1-91.

Tiridates (238-314), king of the Armenians; and Christianity, 1-212.

Tirnovo (tn. Bulgaria). See *Trnovo*.

Tirol or Tyrol. Dist. of Austria and N. Italy, famous for scenery, 7-280, 281 illus.; Tirolese dancers, 1-324 illus.

Tirpitz [tēr'pits], Alfred von (1849-1930). German grand admiral 1911-16; created powerful Ger. navy; rejection of certain recommendations brought his resignation in March 1916; beard, 1-398 illus.

Tirpitz. Ger. battleship, sister ship of *Bismarck*, completed 1940; in Ger. invasion of Norway; attacked Allied convoys to Russia from her base in Alten Fjord; sunk by R.A.F. in Tromsø Fjord, 1941.

Tirso. R. of Sardinia; hydro-electric works, 6-499.

Tiryns [tir'ins]. Anc. city of Greece in

T L S I P H O N E

Targols, destroyed 468 A.C., excavations by Schliemann revealed finest palace of Mycenaean Age in Greece; 1-24.

Tarphone, (tā'fōnē), in Gk. myth., one of Furies.

Tasset (tā'sēt), James Joseph Jacques (1836-1902), Fr. painter and illustrator; famous illustrations to New Testament characterized by minute realism.

Tissue, in human body, 6-189; water and, 7-425.

Tizze (river). See **Thessa**.

Thes crane, in engineering, 2-525.

Thiania, Fairy queen in Shakespeare's *A Midsummer Night's Dream*, 6-200.

Titanic, White Star liner sunk by iceberg on maiden voyage 1912, 6-229; 1,490 passengers drowned; 711 survivors saved by radio, 6-348.

Titanium (tī), Chem. element; atomic no. 22, atomic weight 47.90; melts at 1,730°C.; 7-282, 3-224.

Titanium dioxide, used in paper-making, 6-71.

Tigano, Mt. San Marino, Italy, 6-498.

Tifania, in Gk. myth., rebellious giant children of Uranus, 7-522, 7-370, 3-17.

Tithe, Tax of one-tenth, usually on land; levied, especially for religious purposes, from anc. times; in England in 1536 there was passed an Act converting the Queen Anne's bounty (tithe rents) into tithe redemption stock.

Tithonus, in Gk. myth., mortal husband of the goddess Aurora (Eos), the Dawn, 1-310.

Titian (c. 1577-1578), It. painter, 7-282, 4-310, 6-386; Philip II of Spain, 6-155, illus.; St. Christopher and the Child, 4-321, illus.

Titicaca (tē'tōkāk'kah), Lake. Largest lake of S. Amer., between Peru and Bolivia, area approx. 3,200 sq. m.; 1-507, 508, illus.; 6-168, 7-96; steamer service, 6-141.

Tlisse, Lake in Black Forest, Germany, 151 m. w.w. of Freiburg, 4-119.

Titles and Forms of Address, 7-283; in Brit. Royal Family, 6-163.

Titmouse, Bird of 1st family. See **Tits**.

Tito, Marshal. Adopted alias of Josip Broz (b. 1891). Yugoslav guerrilla leader, became prime min. and min. of defence, 1945; pres. of Yugoslavia from 1953; 7-520, 517, illus.

Titograd (formerly *Podgorica*) Cap. of the federal republic of Montenegro; pop. 12,272, 7-518, 5-250.

Tits, Small insect-eating birds, 7-285, 1-159, illus.

Titus, Gk. disciple of the Apostle Paul (Gal. II, 1, 3) (N.T.).

Titus, Flavius Sabinus Vespasianus (A.D. 40-81), Rom. emperor; succeeded Vespasian A.D. 79; humane and able ruler; captured Jerusalem (A.D. 70), 4-375.

Tivoli (tē'vōlē), Italy. Picturesque walled town 18 m. S.E. of Rome at fall of r. Anio; pop. 10,000; many antiquities.

Tiw, Teutonic war god; gives name to Tuesday, 3-55.

Tiza, R. of Hungary; fertile valley, 4-205.

Tlaxcala (tlāskāl'lah), Mexico. State in S.E.; area 1,535 sq. m.; pop. 224,000; cap. Tlaxcala.

Tlemcen (tlem'sen), Algeria. Trading town near frontier of Morocco; pop. 41,400; former centre of Moorish art and culture.

Thinkits (tīnk'kītz), group of N. Amer. Indian tribes, 1-90.

T.N.T. (trinitrotoluene) an explosive, 3-330.

Toad, Tailless amphibian, 7-286; eye, 3-333, illus.; distinguished from frog, 3-472; and natural selection, 3-323.

Toadflax, Ramsted, or Butter and Eggs. A genus *Linaria*, of herbaceous plants native to Europe and Western Asia; the flowers of the common toadflax, grown in racemes, are pale yellow, except for an orange ridge on one lobe of the corolla, and have a short spur. Fam., *Scrophulariaceae*.

T O N L E - S A P

Toadstool, Type of fungus, 3-489.

Tobacco, 7-286, 287, 288, illus.; popularised by Raleigh, 6-362; in Rhodesia, 6-394, illus.; Victorian etiquette and smoking, 3-302.

Tobago or **Tabago**, One of Brit. W. Indian Is.; area 116 sq. m.; pop. 32,600; exports sugar, coffee, rubber, tobacco, cacao; 7-317.

Tobermory, Spt. of the Isle of Mull, Argyllshire, Scot.; after the defeat of the Armada (1588) a Span. galleon, containing treasure, sank in Tobermory Bay. Several attempts have been made to recover the treasure.

Tobolsk, Tn. of R.S.F.S.R., in Omak prov. on r. Irtysh; founded 1587 by Cossacks; pop. 25,000.

Tobruk, Spt. of Cyrenaica, N. Africa, 80 m. w. of Bardia; excellent harbour; occupied Oct. 1911 by It.; taken Jan. 1941 by Imp., Brit., and Free Fr.; in April Ger. counter-attack by-passed Tobruk; though besieged for eight months, the Brit. and Imp. garrison harassed Axis communications, and harbour was used to land stores and ship men to Egypt; during Brit. retreat towards Egypt 1942, Tobruk lost to Ger. counter-attack by S. African and Brit. garrison when 28,000 men taken; recaptured with little resistance by S. Africans after Alamain victory; 7-489, 491, 492.

Toby, Punch's dog in show, 6-308.

Tocantins (tōkahn'tēnz'), Largo r. in cent. Brazil, flowing N. 1,700 m. to Atlantic Ocean, 2-49.

Top, H. (Talbot House). Association of men and women pledged to Christian service and fellowship; founded, in memory of Gilbert Talbot, by his brother Neville and Rev. P. B. Clayton, at Poppleingham, near Ypres, in 1915; now international; "too" is signaller's pronunciation of "t," to avoid confusion with letters having same vowel sound, like "b."

Toes, of human foot, 3-112, 413, illus.; of mammals, 5-100.

Toga, Rom. flowing garment, 2-420.

Toggenburg Goat, 4-37, illus.

Togo, Heibachiro, Count (1847-1934), Japanese admiral, c-in-c. of Jap fleet in Russo-Japanese War, destroyed Russ. fleet at Port Arthur in 1904.

Togoland, Territory in W. Africa on Gulf of Guinea; area 46,000 sq. m.; pop. 1,310,000; became Ger. colony 1884; divided between Fr. and It. Britain under mandate from League of Nations; in 1946, admin. by Fr. and Gt. Brit. under U.N. trusteeship.

Toilet Soap, manufacture, 7-80.

Tojo, Hideki (1884-1948), Jap. soldier and statesman; war min. in Konoye cabinet, and prime min. Oct. 1941 just before Jap. entered 2nd World War; was also chief of gen. staff in 1914, but resigned both posts when his cabinet fell in July; arrested by U.S. army 1945 and hanged 1948.

Tokay (tōk'kī), Hungary. Tn. 130 m. N.E. of Budapest; pop. 6,000; famous for wines.

Tokay, Hungarian sweet white wine made from over ripe grapes. Finest quality, Tokay Eszencia, or Imperial Tokay, is a liqueur wine with fine flavour and rich bouquet; 4-205.

Tokelau Islands, Isl. group in S. Pacific, 6-28; stamp, 6-30.

Tokugawa (tōkūgah'wah), Family name of the Japanese shoguns or "mayors of the palace" (1600-1868); made Tokyo capital of Japan.

Tokyo, Cap. of Japan; pop. 6,966,499; 7-289, 4-312, 4-340; earthquake (1923), 3-162; war crimes tribunal 4-460.

Toledo, Sp. Former cap. of kingdom on Tagus; pop. 27,443; 7-103; sword blades, 5-89.

Toledo, Ohio, U.S.A. Important Great Lakes port, near mouth of Maumee at w. end of Lake Erie; pop. 303,616; fine harbour; infra. include motor-cars, bicycles, and electrical appliances, 5-506.

Toledo, Mts. of Montes de Toledo, A rugged group of cent. Sp., s. of city of Toledo; highest point 4,750 ft.

Toleration Act, Name given to Eng. statute passed in 1689, under which freedom of worship was granted to Protestant dissenters from the Church of England.

Toller, Ernst (1893-1939), Ger. writer. His best-known works are his plays *Mass-Mensch* (Men and the Masses), and *Maschinenstürmer* (The Machine Wreckers).

Tolls, on roads; riots against, 6-404.

Tolosa, Battle of (1212), and defeat of Moorish power in Spain, 7-103.

Tolpuddle Martyrs, Six labourers of Dorset village, who in March 1834 were transported to Botany Bay for 7 years for forming a society (an offence against the Combination Acts) through which they hoped to press for a weekly wage of 10s. Many protests caused remission of remaining sentence in 1836; 5-138.

Tolstoy, Alexis (1882-1914), Russ. writer; 6-481.

Tolstoy, Count Leo (1828-1910), Russ. novelist, 7-289, 6-480; *War and Peace*, 5-471.

Toltecs, Anc. people of Mexico, 1-333.

Tolu Balsam, in perfume, 6-124.

Toluol or **Toluene**, Substance obtained from coal tar, 2-434.

Tomato, 7-290; as market garden crop, 8-131.

Tom Jones (1749), Novel by Henry Fielding, 5-471.

Tommy Atkins, Nickname for the Brit. private soldier.

Tommy Gun, See **Thompson sub-machine gun**.

Tompson, Thomas (1638-1713), Eng. clockmaker; brought watch- and clock-making to a fine art; made watch for Charles II, and a clock for William III which still strikes the hours.

Tomak, Cap. of region and city of W. Siberia, R.S.F.S.R.; agriculture, mining, motor vehicles, and aircraft pop. 141,000.

Tom Thumb, Character in old fairy tale, a man no bigger than his father's thumb. The name has been given to various dwarfs, notably Charles Sherwood Stratton (q.v.) exhibited by Phineas T. Barnum, the Amer. showman.

Tom-tit, Popular name of the blue tit, commonest Brit. species of tit, distinguishable by its blue and yellow plumage. See **Tits**.

Tone, (Theobald) Wolfe (1763-98), Irish Protestant patriot; formed soc. of United Irishmen in 1790; persuaded the Fr. to send, 1796 and 1798, small expeditions against England on one of which he was captured; sentenced to hang, he cut his own throat.

Tonbridge, Tn. in Kent, Eng., on r. Medway; famous for public school founded in 1553; tanning, cricket ball mfg., brewing; pop. 19,239; 4-395.

Tonga or **Friendly Islands**, Chain of isls. in S. Pacific s. of Fiji Is. under Brit. protection; area 385 sq. m. pop. 15,000; chiefly Polynesian; 6-28; stamp, 6-30, illus.

Tongararo, Active volcano on N. Island, New Zealand, (6,458 ft.) 5-422.

Tongking, Former Fr. protectorate now included in the state of Vietnam Indo-China, 4-256.

Tongue, 7-280; of chameleon, 2-301; of moth, 2-145, illus.; sense of taste, 7-229.

Tonic (music). See **Musical Terms** (list).

Tonie Sol-fa, in music, devised by Guido of Arezzo, 5-303.

Tonka bean, A tree (*Dipteryx odorata*) of the fam. *Leguminosae*, native to S. Amer.; its seeds or beans are used for making perfumes and snuff.

Tonkinese, People of Tonking Vietnam Indo-China, 4-257.

Tonks, Henry (1862-1937), Brit. painter; prof. of painting at the Slade School, London; propagated French impressionist ideas.

Tonie-Sap, or Great Lake, Cambodia

TONNAGE

area varies from wet season to dry, 2-179.
Tonnage of ships; how it is reckoned, 7-32.
Tonsberg. Tn. in Norway; pop. 12,211; 5-161.
Tonsils, 4-224; and general infection, 4-15.
Tonsure. The ritual shaving of the crown of the head in a circle by clerics of the Roman Catholic Church.
Tonty or Tontil [tawn'té], Henry de (c. 1650—c. 1704), Fr. explorer, b. Italy. La Salle's companion on explorations down Mississippi river.
Tonypandy. Mining tn. in Rhondda valley, Glamorganshire, Wales, 7-411 illus.
Tools; in primitive agriculture, 1-71, 1-206; horns, 4-194.
Toothwort. A leafless European herb parasitic upon roots of other plants, 6-215 illus.
Tooting Bec Common. Open space of 154 acres in s.w. London, 5-28.
Topaz. Mineral used as a gem stone, 7-168.
Topes. Buddhist funeral mound; example of early Indian architecture, 4-249.
Topes. Variety of shark, 7-18 illus.
Topoka. Cap. of Kansas state, U.S.A.; pop. 78,791; 4-392.
Top hat, 4-137, 138.
Toplady, Augustus Montague (1740-78), Brit. clerkman, author of hymn "Rock of Ages"; 4-226.
Topology (geometry). See Analysis situs.
Tor, Sir. Legendary knight, son of Sir Hector in Arthurian legend, 1-236.
Torah. Name given by Jews to first five books of the Bible, 5-271.
Torch; electric, 1-386 illus.; Olympic Flame, 5-510, 509 illus.
Tordesillas. Treaty of. Agreement between Spain and Portugal in 1494, adjusting the line of demarcation fixed by Pope Alexander VI in 1492 granting to those countries right of possession to the Americas. The treaty moved the line east to Portugal's benefit and brought Brazil into the Portuguese sphere, 1-132.
Torgau [tôr'gaw]. Tn. in Land of Saxony-Anhalt, E. Germany, on Elbe, 30 m. N.E. of Leipzig; prominent in information; victory of Frederick the Great over Austrians 1760 (Seven Years' War); in 1814 taken by Germans after siege of 3 months; 7-2.
Tormes [tôr'mâ's]. R. of Sp.; rises in mts. of cent. Sp., flows N.W. 150 m. to Douro.
Tornio or Tornea. R., rises in Swedish Lapland and flows S.E. 250 m. to Gulf of Bothnia.
Tornadoes, 7-169; and waterspout, 7-430.
Toronto. Cap. of Ontario, Canada. An act of 1953 merged 12 suburbs in Toronto bringing pop. to more than 1,000,000; 7-291, 2-202, 5-512 illus.
Toronto, University of, at Toronto, Ontario; co-ed., non-sect.; founded 1827 (present name since 1849); arts, science, engineering, medicine, dentistry, law, agric., forestry, etc.
Torpedo, 7-291; launching 5-350 illus.; radio-controlled, 4-103; carried by submarine, 7-176 illus.
Torpedo-fish, 7-294.
Torquay. Spt. and holiday resort on s.e. coast of Devon, Eng.; pop. 53,216; harbour, 3-254 illus.
Torque. In engineering, a force applied in such a way as to cause rotation; in helicopter, 4-159.
Torquemada [tôr'kah'mah'dah], Tomás de (1420-98). Span. Dominican friar, organizer of Inquisition in Spain; became inquisitor-general; incited expulsion of Jews from Spain, 4-263.
Torrens, Lake. Salt lake of S. Australia, 130 m. long, 20 m. broad. Shallow, dries up in times of drought; 7-102.
Torres, Luis Vaez de. Span. navigator; discovered Torres Strait in 1606, 1-317.

Torres, Strait. Sea passage between Cape York Peninsula, Australia, and Isl. of New Guinea.
Torres Vedras [tor'es vâd'ras]. Tn. of Portugal, 26 m. N. of Lisbon; here in 1810-11 Wellington defended himself against French army, 6-117, 6-267; pop. 8,700.
Torriceilli [tor'ichelli], Evangelista (1608-47). It. physicist; inventor of mercury barometer, 1-370.
Torrige. R. of Devon, Eng.; rises near Hartland Point and flows S.E. into Barnstaple Bay; 36 m. long.
Torridon, Loch, Scot. Salt-water inlet of W. coast of Ross and Cromarty, 6-455.
Torrid zone. See Tropical zone.
Torrigiano, Pietro (1470-1522). Florentine sculptor; tomb of Henry VII, 6-385 illus.
Torrington, George Byng, 1st Viscount (1603-1733). Eng. naval officer; mainly responsible for the fleet going over to the Prince of Orange; prominent at Beachy Head in 1690, and at capture of Gibraltar in 1703; totally defeated Spaniards off Cape Passaro in 1718.
Torse, or Wreath. In heraldry, 4-165.
Tortilla. Flat cake made from maize, 5-187.
Tortoises and Turtles, 7-294, 6-388 illus.; foot of box tortoise, 3-413 illus.; *Why the Tortoise Beats the Hare* (story), 7-207.
Tortoiseshell, obtained from the hawk, 6-215 illus.; 7-296.
Tortoiseshell butterfly; egg, 3-171 diag.; hibernation, 4-173.
Tortrix. Any moth of family *Tortricidae*; the best known of these small moths is the green oak tortrix (*T. viridana*), a destructive pest of oak trees.
Torture, as punishment, 6-290; used by Inquisition, 4-263.
Tory party. Opponents of Whigs in 17th and 18th cents. Name still often applied to Conservatives (q.v.).
Tosca, La. Opera by Puccini; story, 5-520.
Toscanelli dal Pozzo [toskanelli dal pot'sô], Paolo (1397-1482). It. astronomer; suggested western route to the Indies to Columbus.
Toscanini [toskaneni], Arturo (b. 1867). It. conductor, principal conductor at La Scala Opera House, Milan, 1898-1908 and 1920-29; 1908-15 Metropolitan Opera House, New York City; N.Y. Philharmonic Symphony Orch. 1926-36; N.Y.C. Symphony Orchestra 1937-48.
Tosks. People of Albania, 1-92.
Tosti, Sir Francesco Paolo (1846-1916). Anglo-Ital. song composer; ("Good-bye," "Ask Me No More"; "Parted," etc.).
Total internal reflection of light, 4-500.
Totalisator (Tote). A machine for registering bets; the sums paid out are regulated by the amounts invested.
Totalitarian State. One with a highly centralised form of government (e.g., Nazi Germany, Fascist Italy, and Communist U.S.S.R.) under control of a single party, based on the theory of the state as the supreme expression of all spheres of national life.
Totara. Coniferous tree of New Zealand used for timber, 5-422.
Toten Pole, 6-72 illus.; Alaskan, 1-88 illus.
Tottenham. Bor. of Middx., Eng., part of London urban area; famous Tottenham ("Spurs") Assoc. football club; brewing and other industries; pop. 126,920.
Toucan. American bird, 7-301, 7-97 illus.; beak, 7-301 illus.; foot, 1-471 illus.
Touch. One of the senses, 7-301; in training the blind, 1-488.
Toul [tôl]. Strongly fortified tn. in N.E. France; pop. 10,000; important in Middle Ages.
Toulon. Important spt. and naval base of Fr. on Mediterranean; pop. 125,700; in 1707 unsuccessfully besieged by Prince Eugene; in

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1744 Brit. fleet defeated by French and Spanish; in July 1793 port besieged and occupied by British; retaken by French in Dec.; French fleet scuttled Nov. 28, 1942.
Toulouse [tôl'ôz'] (anc., Tolosa). Cathedral city, commercial and mfk. centre in s.w. Fr. on Garonne; pop. 264,400; 3-433, 4-263.
Toulouse-Lautrec [tôl'ôz' lô'trek'], Henri de (1864-1901). Fr. impressionist painter, lithographer, and caricaturist; famous for paintings of theatre and circus life; 3-149.
Touraine [tô'rân']. Former prov. of France corresponding to present dept. of Indre et Loire; cap. Tours.
Touring [tô'r'kwan']. France. Mfg. tn. 8 m. N.E. of Lille; pop. 76,000; woollens, carpets, upholstery.
Tourist Trophy. Motor-cycle races held in Isle of Man, 5-275, 271 illus., 5-110.
Tourmaline. Crystalline substance, used as a gem stone; and polarised light, 4-501.
Tournai or Tournay [tô'r'nâ']. Mfg. city of s.w. Belgium on Scheldt, near Fr. border; pop. 31,500; carpets, textiles, porcelain.
Tournement, in Middle Ages, 4-117 illus. f.
Tourniquet [tô'r'nîk]. Bandage applied very tightly above cut on limb to stop bleeding.
Tours [tô'r]. City in w. cent. France, on Loire, pop. 80,000; makes silk stuffs, chemicals, iron and steel; formerly cap. of Touraine; battle of (732), 5-309, 5-89.
Toussaint. L'Ouverture [tô'sân lô'vâ'tiô'r]. Pierre Dominique (1746-1803). Haitian Negro rebel and liberator; threw off Fr. rule and became pres. and dictator of Haitian republic (1801); captured by treachery; died in Fr. prison.
Tower Bridge, London, 5-20, 29 illus.
Tower mill. Type of windmill, 7-159, 460 illus.
Tower of London, 7-301, 5-29 illus.; beheading axe and block, 7-301 illus.; protection of crown jewels, 6-163; princes in the tower, 3-167; English prisoner in, 6-362; ravens, 6-367 illus.; White Tower, 5-19.
Towers of Silence. High towers where the Parsees expose their dead to vultures; 1-515, 6-93 illus.
Town Council, a governing body elected by local ratepayers to control municipal affairs; its members look after borough property and impose rates for public purposes; they are elected for 3 years and may be asked to serve on various committees; the chairman is known as the mayor in Eng., and provost in Scot.
Town Planning, 7-303; Nash's work, 1-217, modern, 1-219.
Townsend, Charles Townsend, 2nd Viscount (1671-1739). Brit. politician and agriculturist, nicknamed "Turnip" Townsend; experiments in crop rotation, 1-78, 4-259.
Townsend, Charles (1725-97). Brit. politician; chancellor of the exchequer under Pitt; author of Townsend duties.
Townshend, Sir Charles Vere Ferrers (1861-1924). Brit. general; served in Sudan, on the Nile, and in S. Africa; besieged in Kut 1915-16 and taken prisoner by the Turks.
Townsville. Spt. and city of N. Queensland, Australia, 880 m. N.W. of Brisbane, pop. 35,200; exports sugar.
Townton. Vill. in Yorks., Eng.; decisive victory of Yorkists, under Edward IV, over Lancastrians, 1161 (Wars of the Roses), 6-454.
Towy. R. of Cardiganshire, Wales, rises in N.E. and flows 60 m. into Carmarthen Bay.
Townyn. Seaside resort in Merionethshire, Wales; pop. 4,490; 5-175.
Toxin. Poisonous organic substance, formed by bacteria, 4-14.
Toynbee, Arnold (1852-83). Brit. pioneer in social settlement work; Toynbee Hall in Whitechapel, London, is named after him.

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Toyokuni (1709-1825). Jap. artist and colour printer, 4-354.
Toy Soldiers, anc. Egyptian, 1-245 illus.
Trabzon or Trebizond (anc. Trapézus) Turkey. Spt. on Black Sea; pop. 50,000; varied mfrs.; former centre of transit trade between Europe and Persia; cap. of empire of Trebizond (1204-1461); taken by Russia (1916), recaptured by Turks (1918).
Trace-element. See *Isotope*.
Tracer-shells. Gunnery, 1-174.
Tracery. In architecture, the species of pattern work formed or traced in the head of a Gothic window by the mullions being continued, but diverging into arches, curves, and flowing lines enriched with foliations.
Trachea [trá'kia or trák'eá]. Air passage or windpipe of an animal; 6-51, 7-404.
Trachodon [trá'kódon]. A prehistoric monster reptile; remains have been discovered in N. America.
Track, prefabricated rly. track, 6-357 illus.
Track-testing coach, for recording faults on rly. tracks, 6-357.
Tractarianism. See *Oxford Movement*.
Tractor. A "mechanical horse". 7-304; in agriculture, 1-71, 72, 74, 75, 76 illus.; 1-70; caterpillar tractor, 1-71 illus.; ploughing with, 6-225 illus.; in Russia, 6-175 illus.
Trade, Board of. Brit. govt. dept., responsible for promoting and regulating home and export trade of the U.K. Presidency of board is a political appointment, and pres. is sometimes member of the cabinet. Estab. 1631 as committee of privy council.
Trade Fair, 3-326.
Trade-mark. A symbol affixed by a manufacturer or merchant to special goods or classes of goods which are protected by law; trademarks are registered at the Patent Office.
Trade Union, 7-304; Boy's work for, 1-410; support of Labour party, 4-17. See also *Tolpuddle Martyrs*.
Trades Union Congress, 7-304; and general strike, 7-352.
Trade Winds, and rainfall, 6-360. See also *Wind*.
Trailfalgur, Battle of (1805), 7-304, 305 illus.; 5-363, 5-350; Collingwood at, 2-151.
Trailfalgur Square, London, 5-361, 5-31 illus.; 6-176 illus.; 5-21 illus. f.
Traffic, police control, 6-251.
Traffic Lights, controlled by selenium coils, 6-530.
Tragedy, Greek, 3-116; Shakespearean, 7-11.
Training, Athletic, 1-290.
Traitors' Gate. Tower of London, 7-301, 302 illus.
Trajan (Marcus Ulpius Trajanus) (A.D. 51-117). Rom. soldier-emperor; adopted son of Nerva; humane, able ruler, great builder, conqueror of Dacia, Armenia, and Parthia; 6-439; bridge over Danube, 2-66; Forum Vetus at Lyons, 5-55.
Trajectory. The curved path of a falling or projected body (e.g. aerial bomb or artillery shell), 5-159, 157 illus.; of artillery shell, 1-259.
Tramp. A cargo ship, 7-32.
Tramps or Vagrants; chalk-mark codes, 2-111.
Trams and Trolley-Buses, 7-305, 306 illus.; magnetic brakes, 2-11; in London, 5-28.
Tram Silk, used for web in silk weaving, 7-54.
Trans-Andean Railway, 6-498.
Trans-Continental Railway, Australia, 7-102.
Transcaucasian S.F.S.R. (Soviet Republic), 2-524.
Transit. See *Architectural Terms*.
Transformer. Device for converting electrical energy received at one voltage to electrical energy sent out at a different voltage, 7-307; 6-340 illus. f.; in grid electricity, 3-218; for high-frequency induction currents, 4-174.
Transfusion, Blood. See *Blood Transfusion*.

Transjordan. See *Jordan*.
Translation, of Bible, 1-112, 143.
Transmigration of Souls, Pythagorean belief, 6-314.
Transmission, in motor vehicles, 5-278.
Transmitter, radar, 6-338; radio, 6-344 illus.; 6-342; Marconi's, 6-340 illus.
Transmitting Station, 6-340 illus. f.
Trans-Mongolian Railway, 6-236.
Transmutation. In chemistry, the changing of one element into another; usually achieved by bombarding it with swiftly moving particles such as neutrons, protons, etc., 1-300; alchemists' attempts at, 1-95.
Transom. In architecture, a horizontal stone bar dividing a window; seldom seen before 15th cent.
Transpiration. Process of evaporation of water from the stomata in the leaf surfaces of plants; probably assists the movement of water up the stem, 4-169, 6-215.
Transplanting, in gardening; method, 6-216.
Transport; through the ages, 6-412 illus. f.; aeroplane, 1-27; airship, 1-83; air transport, 1-85; canals, 2-201; cycles and cycling, 3-14; locomotive, 5-9; in London, 5-27; motor-cycles, 5-273; motor vehicles, 5-277; railways, 6-351; roads, 6-404; road transport, 6-109; trams and trolley-buses, 7-305; tunnels, 6-7-325; underground sys., 7-315; and the wheel, 7-158.
Transportation, of convicts to Australia, 1-317, 318, 2-43.
Transporter Bridge, 2-69.
Trans-Siberian Railway, 6-172, 7-18.
Transubstantiation. In theology, doctrine of the change of the whole substance of the bread and wine, by consecration at the celebration of the Holy Eucharist, into the Body and Blood of Christ; it is a dogma of the R.C. Church.
Transvaal. Prov. of Union of S. Africa; area 110,450 sq. m.; pop. 1,670,123; 7-308, 2-44; founded by Boers, 1-51; Pretoria, 6-285; gold mining, 4-39, 40; settlement, 7-91.
Transylvania. Prov. in N.W. Rumania, formerly part of Hungary; area 22,312 sq. m.; pop. 3,399,000; 4-207, 6-169.
Transylvanian Alps. Mt. range of Rumania, S.E. section of Carpathian Mts., 6-169, 3-369.
Trapani [trá'pahnié]. Spt. and industrial centre on N.W. coast of Sicily; pop. 63,540; anc. Drepanum, important Carthaginian naval station in First Punic War; Rom. fleet defeated 250 B.C.
Trap-door Spider, 7-131.
Travancore-Cochin. State of Rep. of India; area 9,155 sq. m.; pop. 9,265,157; cap. Trivandrum; 4-241.
Travel, and overseas careers, 2-230.
Traveller's Jog. The usual name for *Clematis vitalba*, climbing plant very common in Brit., known also as "Old Man's Beard," from long, silky threads attached to fruits.
Travelling Post Offices (T.P.O.), 6-270.
Traviata, La. Opera by Verdi, first produced in Venice in 1853; story, 5-520.
Trawler. Fishing boat, 3-380, 272 illus.
Tread. See *Architectural Terms*.
Treasure Island. Adventure story by R. L. Stevenson, famous for practical character Long John Silver; 7-156.
Treasury. Brit. govt. dept. responsible for collecting and expending the national revenue, 4-52.
Treaties. See list on opposite page.
Treaty ports. In China, ports at which foreign traders formerly enjoyed special privileges, 2-373.
Trebizond. See *Trabzon*.
Treble. The soprano voice of boys and girls, 7-57.
Trecento. Italian name for 14th cent.
Tredegar. Tn. in Monmouthshire; has coal mines and iron works; pop. 20,375; 5-245.
Tree, Sir Herbert Beerbohm (1853-1917). Brit. actor-manager, half-brother of Sir Max Beerbohm; famous for

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revivals of Shakespeare's plays at His (now Her) Majesty's Theatre, London.
Tree Frog, protective coloration, 6-296, illus. f.
Tree Kangaroo. Animal, 4-392.
Tree Line, in mountains, 3-420.
Tree Mallow. Flowering tree, 5-97.
Tree Money, 5-234 illus.
Tree of Knowledge. In the Bible story of the Fall, the tree which bore the forbidden fruit plucked by Eve, 1-15.
Tree-pit. Bird, 6-205; egg, 1-452 illus. f.; migration, 5-201 illus. f.
Tree Porcupine, a rodent, 6-260.
Trees, 7-308, 309-315 illus.; calculating height of, 7-317; forests, 3-120; growth, 6-216; length of life, 6-218; as lightning conductors, 4-505; lumbering, 5-49. See also *Timber*, and various trees by name.
Tree Sparrow, 7-123.
Trefoil ("three-leaved"). A name applied to the clovers (*Trifolium*) and other plants having compound leaves in three parts; the birds' foot trefoil (*Lobus pedicularis*) is so called because it has clusters of pods resembling a bird's foot; other species are hop trefoil, hare's foot, and straw-berry-headed trefoil, all so called from the appearance of the bunches of flowers. See also *Shamrock*.
Trefoil. In architecture, an ornament used in the Gothic style, formed by mouldings so arranged as to suggest the shape of the trefoil (see above).
Trelawny, Edward John (1792-1881). Brit. traveller and adventurer, deserted from navy and wandered about the world, friend of Shelley and Byron, about whom he wrote, carried out Shelley's cremation, fought for Greek independence.
Trenails. Hardwood pins used by carpenters, 5-313.
Trench, Richard Chenevix (1807-86). Archbishop of Dublin, poet and philologist (*The Study of Words*), and dictionary, 3-48.
Trenchard, Hugh Montague Trenchard 1st Viscount (b. 1873). Brit. admiral; chief of air staff (1918-20); marshal of R.A.F. (1927); commissioner of Metropolitan Police (1931-35); established Police College Hendon, 6-251.
Trengganu. State of the Federation of Malaya; area 5,050 sq. m.; pop. 225,996; 5-94.
Trent, Jesse Boot, 1st Baron (1850-1931). Brit. business man, founder of the firm of Boots the chemists; gave large sums to Nottingham Univ. Coll. (now Nottingham Univ.).
Trent. Lt. of cent. Eng. flowing s. and N.E. 180 m. to Humber; 7-111, 4-512.
Trent (St. Trento). (City in N.E. It., cap. of prov. of Trento on R. Adige; pop. 56,000).
Trent, Council of (1547-63), and doctrines of R.C. Church, 6-126, 378.
Trent affair. Dispute in 1861 between Gt. Britain and the U.S. Federal govt. over the seizure during the Civil War of two Confederate envoys travelling on a British ship, the *Trent*; Prince Consort and, 1-93.
Trentino-Alto Adige. Region of Italy divided into provs. of Bolzano and Trento. Formerly the southern part of Austrian Tirol, it was called Trentino when acquired by Italy in 1919; its name was changed to Trentino-Alto Adige in 1947. Area 5,252 sq. m.; pop. 736,414; 7-281, 4-304.
Trenton. Cap. of New Jersey, U.S.A. pop. 127,867; mfrs. include wire, rope, cables, pottery, and rubber products; 5-398.
Trepang. Sea Cucumber, or *Bêche de mer*. Dried bodies of large sea-slugs used as a food; 6-29.
Trepanning or Trephining. Surgical operation consisting in removal of disc of bone from skull for purpose of relieving pressure, removing tumours, etc. Practised by prehistoric Man, 5-161.
Tresco. One of the Scilly Isles, 6-509

TREVELYAN

Trevelyan, George Macaulay (b. 1876). Brit. historian, son of Sir G. O. Trevelyan; Regius prof. of mod. hist. at Cambridge from 1927; O.M. 1930; Master of Trinity Coll. 1940-51; chancellor of Durham Univ. 1950. Works include histories of England and mod. Italy, and *English Social History* (1944).

Trevelyan, Sir George Otto (1838-1928). Brit. politician and author; chief sec. for Ire. (1882-81); chancellor of Duchy of Lancaster (1884-85); twice sec. for Scotland; nephew of Lord Macaulay, whose *Life* he wrote; books on Charles James Fox and *The American Revolution*.

Trèves or Trier. City in Land of Rhineland-Palatinate, W. Ger.; pop.

76,700; imperial residence under later Rom. Empire; fine Roman amphitheatre, basilica, baths, damaged, and cath. ruined, during 2nd World War; archaeological finds in cathedral, 1-205.

Treviso (trā'vɛzɔ) (anc. Tarvisium). It. city, 16 m. N. of Venice; pop. 53,900; textiles, metal ware; art centre; city republic under Lombard League.

Trevithick, Richard (1771-1833). Brit. engineer and inventor, 7-316; and (luc.-boller, 1 501; steam engine, 5-1, 6 413; attempted to drive a Thames tunnel, 7 325.

Trial by Combat, or judicial duel, 4 389.

Trial by Compurgation, in Anglo-Saxon times, 4 389.

TRICHINA

Trial by Ordeal, in Anglo-Saxon times, 4-389.

Trial of the Pyx. See **Pyx**, **Trial of the Triangle**, in geometry; area of, 5-170; theorem of Pythagoras, 3-517; in trigonometry, 7 316.

Triangle, Percussion instrument, 5-307.

Trianon. Palaces at Versailles Fr., 7-394.

Trianon, Treaty of (1920), between Hungary and Allies, 4 207.

Triassic Period. In geology, 3-515, 516.

Tribhuvana (1907-55). King of Nepal, 6-367.

Tribunes. Officials of anc. Rome, who represented the plebeians, 6-430.

Triceratops. Prehistoric animal, 6-281.

Trichina (trik'ina). A parasitic worm, sometimes found in the muscles of a

SOME HISTORIC TREATIES AND ALLIANCES

Adrianople (1829): Treaty following Russo-Turkish War of 1828-29, recognizing the independence of Greece.

Aix-la-Chapelle (1748): Ended War of Austrian Succession.

Algiers, Convention of (1906). Defined international trading rights of and recognized independence of Morocco.

Amiens (1802): Treaty between England and France, which gave a breathing spell in the wars of the French Revolution.

Augsburg, Religious Peace of (1555): Charles V. granted toleration to Lutheran princes and cities in Germany.

Berlin, Congress of (1878): Revised in Turkey's favour treaty of San Stefano which ended Russo-Turkish War, 1877-78. Montenegro, Serbia, and Rumania made independent of Turkey; Bulgaria, while remaining under its rule, was given a Christian government, but with less territory than provided at San Stefano.

Brest-Litovsk (1918): Peace treaty forced upon Bolshevik Russia by victorious Germany, requiring the surrender of border states and the payment of an enormous indemnity.

Brétigny (1360): Afforded break in the Hundred Years' War between England and France. Edward III renounced his claim to the French crown, and received southern provinces in full sovereignty.

Brussels (1918): Gt. Britain, France, Belgium, Netherlands, and Luxembourg pledged for 50 years to help each other if attacked.

Bucharest (1913): Ended second Balkan War.

Cambrai, League of (1509): Formed against Venice by the Pope, the Empire, France, and Spain.

Campo Formio (1797): Between France and Austria, after Napoleon Bonaparte's first campaign in Italy.

Clayton-Bulwer (1850): Between Great Britain and the United States, providing that neither power should have exclusive control over any canal built across Panama Isthmus or Nicaragua.

Frankfort (1871): Definite treaty at end of Franco-Prussian War; France forced to surrender Alsace and much of Lorraine to Germany and pay an indemnity of £200,000,000.

Ghent (1814): Between United States and Great Britain, ending War of 1812.

Hay-Pauncefote (1901): Between United States and Great Britain, settling aside Clayton-Bulwer agreement, and allowing the United States to build and fortify the Panama canal, although maintaining its neutrality.

Holy Alliance (1815): Declaration of impractical Christian brotherhood signed by Russia, Austria, Prussia, and other European powers (except Pope, Turkey, and Great Britain).

Lausanne (1923): Treaty defining the European boundaries of Turkey and in part her frontiers in Asia.

Locarno (1925): A pact of mutual guarantees regarding territory signed by Great Britain, Germany, Belgium, France, and Italy, and of arbitration between Germany and Belgium, France, Poland, and Czechoslovakia.

London (1913): Ended first Balkan War.

Lunéville (1801): Treaty between France and Austria, following Bonaparte's second Italian campaign.

Neuilly (1919): Treaty between Allies and Bulgaria at end of First World War, ceding Bulgarian territory to Rumania, Serbia, and Greece.

North Atlantic (1949): Defensive alliance between U.S.A., Canada, Gt. Britain, France, Belgium, Netherlands, Luxembourg, Norway, Denmark, Italy, Portugal and Iceland. Greece and Turkey acceded to the treaty in 1952.

Nystadt (1721): Peace between Russia and Sweden, involving cession to Russia of territory along the Gulf of Finland conquered by Peter the Great.

Paris (1763): Terminated Seven Years' War (between Britain and France and Spain). France lost all her American possessions, except Louisiana, to Great Britain.

Paris (1856): End of Crimean War.

Paris (1898): End of Spanish-American War; Cuba liberated and Puerto Rico, Guam, and Philippines ceded to United States in return for £4,000,000.

Paris (1928): "To renounce war as an instrument of national policy"; originally signed by fifteen nations, including Great Britain, France, and U.S.A., afterwards by many others.

Paris (1947): End of Second World War; treaties signed with Italy, Finland, Rumania, Hungary, and Bulgaria.

Portsmouth (1905): Termination of Russo-Japanese War.

Pressburg (1805): Peace between France and Austria, after the latter had been defeated for the third time by Napoleon.

Pretoria (1902): Ended Boer War. Transvaal and Orange Free State lost their independence, becoming British colonies.

Rapallo (1920): Settled controversy between Italy and Yugoslavia over Fiume, giving it status of a sovereign city contiguous to Italy.

Riga (1921): Russia ceded to Poland 44,000 square miles of territory with 3,045,000 inhabitants.

Russo-German Pact (1939): Pact of non-aggression concluded between Germany and the Soviet Republics.

Ryswick (1697): Treaty of peace between France and England, Spain, and Holland.

St. Germain (1919): Treaty with Austria at end of First World War, breaking up the Dual Monarchy into Austria, Hungary, Czechoslovakia and Yugoslavia, and ceding territory to Poland and Rumania.

Sèvres (1920): Treaty of peace with Turkey at end of First World War, depriving it of over half its population and two-thirds of its territory. Not ratified by Turkey.

Shimonoseki (1895): Treaty of peace ending Sino-Japanese War of 1894.

Tilait (1807): Treaty of peace and alliance between Napoleon and the Tsar of Russia.

Trianon (1920): Treaty between Allies and Hungary at close of First World War; established boundaries with Hungarian cessions to border states.

Triple Alliance (1882): A defensive alliance created when Italy joined the Dual Alliance of Germany and Austria, formed in 1879.

Triple Entente (1907): Diplomatic union of Great Britain, France and Russia to counterbalance the Triple Alliance, concluded when agreement between the United Kingdom and Russia (1907) and the United Kingdom and France (1904) was added to the Dual Alliance of France and Russia (1891).

Troyes (1420): Treaty interrupting Hundred Years' War between England and France. Henry V of England was to marry Catherine of France and succeed to French throne on death of Charles VI.

Utrecht (1713): Peace treaty after the defeat of the French in the War of the Spanish Succession. Crown of Spain with its American possessions given to French claimant, Naples, Sardinia, Milan, and Spanish Netherlands ceded to Emperor Charles; Brit. in acquired Gibraltar.

Verdun, Partition of (843): Treaty among the three sons of Louis the Pious, dividing Charlemagne's empire into three parts, the western third of which later developed into France and the eastern third into Germany.

Versailles (1763): End of War of American Independence.

Versailles (1919): Treaty of peace with Germany following First World War. Germany lost territory in Europe amounting to almost 40,000 square miles, and more than 1,000,000 square miles of colonial possessions; reparations of many million pounds to be paid.

Vienna, Treaties of (1815): Division of Europe following overthrow of Napoleon. Russia annexed a large part of Poland, and northern Italy was given to Austria; Austrian Netherlands were given to Holland, and part of Saxony to Prussia.

Washington (1871): Between Great Britain and United States, referring the Alabama claims and the north-west boundary dispute to arbitration.

Washington (1922): A series of treaties signed at the conference of nine great powers at Washington, 1921-22; the most important were (a) Five-Power Naval Treaty providing for a reduction in naval armament; (b) Five-Power Treaty restricting the use of submarines and prohibiting use of poison gas; (c) Four-Power Treaty, between United States, Great Britain, France, Japan, providing for maintenance of existing conditions in Pacific; (d) Nine-Power Treaty relating to China.

Webster-Ashburton (1842): Between Great Britain and United States, settling the north-east boundary dispute.

Western Hemisphere Defense (1947): Between 19 American nations, for defence against aggression. Signed at Petropolis, Brazil.

Westphalia (1648): Ended Thirty Years' War.

- man; though more commonly occurring in pigs and rats.
- Triabinopoly** (trik'nap'oli). Tn. of Madras, Rep. of India, on r. Canvey; pop. 159,500; cheroots, woven fabrics, hardware, jewelry; 5-70; Clive at, 2-411.
- Trichoptera** (Zool.). Order of insects, 4-370.
- Tricolour**. The red, white, and blue colours of the Fr. flag; originated by Lafayette, 4-437.
- Triospid Valve**, of heart, 4-144 with diag.
- Trident**. Three-pronged spear carried by Neptune; borne by Britannia as symbol of sea power.
- Trig**. Loch. Fresh-water loch, Inverness-shire, Scot., 4-275.
- Trier**. See *Trèves*.
- Trieste** (tré'st). Spt. on Adriatic at head of Gulf of Trieste; pop. 271,452. Ceded by Austria-Hungary to Italy after 1st World War. Attempted occupation by Yugoslavia in 1945 after 2nd World War. With a strip of country inland, was to become a free territory under a U.N. governor, but non-agreement on choice of governor led to continued occupation of zone by U.K., U.S.A., and Yugoslavia. In 1954 an agreement was made dividing the territory of Trieste, the Anglo-American zone becoming Italian, and the Yugoslav zone remaining under Yugoslav control.
- Trifoliate**. The term for a three-lobed leaf like that of clover, 4-471.
- Trigonometry**, 7-316, 317 illus.; first treatise on, 6-301.
- Trilene**. Inhalation anaesthetic; use in 2nd World War, 1-113.
- Trilobite** (tril'obit). An extinct crab-like animal. Abundant in Cambrian times, 3-515; fossils, 3-126.
- Trim**. See *Architectural Terms*.
- Trimeter**, line in poetry, 6-231.
- Trimmer**. See *Architectural Terms*.
- Trincomalee**. Naval base and harbour of Ceylon, 99 m. N.E. of Kandy; pop. 21,500; 2-298.
- Trinidad**. Isl. of Brit. W. Indies; area 1,861 sq. m.; pop. 530,376; 7-817; asphalt lake, 1-274.
- Trinitrotoluene**. See *T.N.T.*
- Trinity**, Doctrine of the. In theology, the belief that there are three persons in God or the divine nature, the Father, Son, and Holy Ghost.
- Trinity College**. Cambridge Univ., 2-182.
- Trinity College**, Dublin# 3-130, 4-285; library, 4-487.
- Trinity College**, Oxford Univ., 6-18; arms, 4-165 illus. f.
- Trinity Hall**, Cambridge University, 2-182.
- Trinity House**, London, 7-317; and lighthouse, 4-502.
- Trinity River**, Texas, U.S.A. Flows 550 m. S.W., entering Galveston Bay 40 m. N. of Galveston.
- Trio**. In music, a composition written for three voices or three instruments; the term is also used to denote a subsidiary movement in 3-4 time, common in certain forms of composition also of any combination of three performers.
- Tripartite Pact**. See *Berlin Pact*.
- Triplane**. Type of aeroplane, 1-40, 41.
- Triple Alliance**. Formed 1883 between Germany, Austria-Hungary, and Italy, 4-8, 3-316.
- Triple Entente** (shntahnt'). Agreement between France, Russia, and U.K.; completed in 1907; 3-316.
- "Triplex"**. Proprietary name for a form of laminated glass, 4-62.
- Tripod**. Three-legged support; and Apollo, 1-184.
- Tripoli**. One of the two capitals of Libya, N. Africa; pop. over 140,000; 4-488; and Rom. cities, 1-53.
- Tripoli**. Tn. in Rep. of Lebanon; terminal of pipeline from Kirkuk oilfields; pop. 65,000; 4-473 with illus.
- Tripolitania**. Western part of Libya, 4-489.
- Tripolitza or Tripolis**, Greek tn.; pop. 14,400; cap. of Morea under Turks; taken in 1821 by Ok. insurgents; destroyed in 1826 by Ibrahim Pasha.
- Trip'os**. Term applied to the final honours examination at Cambridge University, so called from the three-legged stool upon which sat the M.A. who delivered the satirical Latin speech at degree-giving on Ash Wednesday, 3-324.
- Tripura**. State of Rep. of India; area 4,049 sq. m.; pop. 649,930; cap. Agartala; 4-239, 241.
- Trireme** (tri'rém). Anc. galley, with three banks of oars.
- Tristan or Tristram of Lyonesse**. Hero of Celtic legend, sent to bring Isolt (Isolde), bride of his uncle, king of Cornwall; drinks by mistake a love potion making him Isolt's lover.
- Tristan and Isolde**. Opera by Wagner; story, 5-520.
- Tristan da Cunha** (tristahn dah koon-yah). Four isls. in S. Atlantic, midway between St. Helena and Cape of Good Hope; since 1938 dependencies of St. Helena, 44 sq. m.; pop. 287; radio and meteorological station; breeding place for albatross and shearwater, 1-92, 7-20.
- Tridium**. Isotope of hydrogen, of atomic weight 3, not found in Nature but produced in nuclear reactions; 4-221.
- Triton** (triton). In Gk. myth, son of Poseidon and Amphitrite, personification of roaring waters; blows a twisted conch-shell to calm or raise the waves; lower tritons are represented with the torso of a man, the tail of a dolphin, and the forefeet of a horse.
- Trivandrum**. Cap. of Travancore-Cochin state, Rep. of India; pop. 131,000; 4-211.
- Trnovo or Tirmovo**. Former cap. of Bulgaria (1880-1904), 2-119 illus.
- Trochee**, foot in poetry, 6-233.
- Trochilidae**. The humming-bird family 4-203.
- Troglodytes**. Name given by ancient Greek writers to various tribes of primitive cave-dwellers; best-known lived along Red Sea.
- Trogon**. A family of tropical forest birds, noted for their gorgeous plumage; they occur in Africa, Asia, S. and Cent. Amer.
- Troilus** (tróilus). In Gk. legend, son of Priam, king of Troy; in medieval legend, hero of the love story which forms basis of Shakespeare's play *Troilus and Cressida*, and Chaucer's poem of same name.
- Trojan War**, 7-320, 321; Achilles in, 1-10; Odysseus, 5-600.
- Trolley-buses**, 7-306, 307; in Gt. Brit., 3-217.
- Troloppo**, Anthony (1815-52). Brit. novelist, 7-318, 3-291.
- Trolls**, in Norse myth, the "hill people," underground elves.
- Trombone**. Musical instrument, 7-322, 5-307.
- Tromp**, Cornelis (1629-91). Dutch sailing ship of following.
- Tromp**, Maarten Harpertzoon (1597-1653). Dutch admiral; defeated Sp. and Port. fleets (1639); fought against English fleet (1652-53), 1-182.
- Tromsø** (troom'sø). Tn. of N. Norway; pop. 10,785; German seaplane base 1940-45; German battleship *Tirpitz* sunk in fjord by British bombers, Nov. 12, 1944.
- Trondheim or Trondhjem**. Spt. on W. coast of Norway; pop. 79,000; timber, fish, copper, iron; 5-462.
- Troodos**. Mt. of Cyprus (6,407 ft.), 3-20.
- Troon**. Holiday resort and spt. in Ayrshire, Scot.; famous golf links; shipbuilding; pop. 10,001.
- Trooping the Colour**. Ceremony in which the Queen's colour is slow-marched before a regiment on the Queen's official birthday, or a regimental anniversary. Also carried out by R.N., Marine, and R.A.F. units. Best-known "trooping" is that held annually on Horse Guards Parade, London, by Foot Guards, 2-466, 3-233.
- Tropical Medicine**, 5-165.
- Tropical Zone or Torrid Zone**, and winds, 7-468.
- Troposphere**. The lowest layer of the atmosphere, 1-80, 5-180.
- Tros**. In Greek mythology, king of Phrygia; gave name to Troy, which his son Ilius founded.
- Trossachs**, The, Scot., 6-512 illus. f.
- Trestle**. Carmarthenshire, Wales; steel works, 4-295.
- Trotsky**, Leon (1879-1940). Russ. revolutionary, 7-318; Lenin and, 4-470; banished by Stalin, 6-470.
- Troubadours**. Minstrels of courts in S. Fr., N. Spain and Italy in 12th-13th cents. In N. Fr. called *trouvères*; 5-304, 4-329.
- "Troubles, The"** (1918-21). Guerrilla war in Ireland, 4-284.
- Trousers**; introduced by barbarians, 2-420; plus-fours, 4-46.
- Trout**. Fresh-water fish, 7-319; fishing, 3-384; hatcheries, 3-380.
- Trouvères**. See *Troubadours*.
- Trouville**. Holiday resort on coast of Normandy, Fr., opposite Deauville, at mouth of Touques r.; pop. 5,500; 5-449.
- Trovatore**, Il. Opera by Verdi, first produced at Rome in 1833; story, 5-520.
- Troy**. Anc. city in N.W. Asia Minor, famous in Gk. legend, 7-319; the Trojan War, 7-320; and Aegaeon culture, 1-21, 25; story of Aeneas, 1-25; archaeology, 1-268; Homer's *Iliad*, 4-159.
- Troyes**, Chrétien de. See *Chrétien de Troyes*.
- Troyes** (trwäh). Fr. tn. on Seine; pop. 58,800; makes hosiery; medical fair; treaty of (1120), 4-163.
- Troy Weight**. See *Weights and Measures* (U.S.).
- Truce of God**. In feudal times, prohibition by Church of private feuds on holy days and seasons, and between Thursday evening and Sunday evening.
- Trucial Coast**. Name given to Arabian shore of Persian Gulf; notorious haunt of pirates until mid-19th cent.; pearl-fisheries; piracy and slave trading, 1-191.
- Trucial Sheikhs**. Seven minor rulers of 400 m. of territory along Trucial coast.
- Trudgeon**. An overarm stroke used in swimming. Though less usual the correct form of spelling is "trudgen," after J. Trudgen, who popularised it, 7-208.
- Trug**, wooden basket, 1-380, 379 illus.
- Trujillo**. Highest mt. in Dominican Republic, 10,417 ft., 3-106.
- Truman**, Harry Shippe (b. 1884) 32nd pres. of U.S.A., 1945-53; 7-321, 322 portrait; 7-363.
- Trumbull**, Jonathan (1710-85). American colonial statesman, gov. of Connecticut; nickname "Brother Jonathan," used to typify the U.S.A., said to come from George Washington's having addressed him thus.
- Trumper**, Victor Thomas (1877-1915). Australian cricketer, one of the most brilliant batsmen ever known. During 1902 tour scored 2,570 runs.
- Trumpet**. Musical instrument, 7-322; method of key-change, 4-194.
- Truro**. Shares with Bodmin (q.v.) the status of co. tn. of Cornwall, Eng. pop. 18,851, 2-598.
- Truss**. See *Architectural Terms*.
- Truss**. In engineering, 2-69, 63 diag.
- Trusts in business**. Organizations for the control of several companies or corporations under one director.
- Try**, in Rugby football, 3-416.
- Tryfan** (triv'an). Mt. in Snowdonia, Wales; height 3,010 ft.; 7-77; rock climbers on, 5-386 illus.
- Trypanosomes** (trip'anósómz). Various single-celled parasitic animals; carry sleeping-sickness germ.
- Tryp'din**. A protein-digesting enzyme.
- Tsar**. Title of Russ. emperors, first assumed by Ivan IV. The wife of a tsar was called a tsarina (also spelled czar and czarina). The word like the Ger. "Kaiser," was a variant of

TSAN KOLOKOL

Tsar Kolokol (Emperor Bell). Great bell at Moscow. 1-426.
Tobolskiy. See **Tobolskiy**.
Tootee Fly. Carrier of disease. 7-323, 8-403, 4-269, 1-85, 6-384.
Tsin. Anc. Chinese dynasty; most important ruler Shi Hwang-ti.
Tsinan or **Tsinanfu**, China. Cap. of Shantung 3 m. from Yellow r.; pop. 512,686; silk, precious stones, glass. Univ.
Tsushima (tsushima). Isl. of Japan in Korean Strait; battle of Sea of Japan fought off its coast (1905).
Tuamotu or **Low Archipelago**. French group of 80 atolls in Pacific s. of Marquesas; area 386 sq. m.; pop. 4,000; shell fisheries, 6-28.
Tuaregs. Nomadic tribe of cent. and W. Sahara.
Tuat. Group of oases in W. part of Algerian Sahara, N. Africa.
Tustara lizard. 4-530.
Tuba. Musical instrument, 8-307.
Tube railways. See **Underground Railways**.
Tubercle bacillus. Discovery of by Koch, 7-195.
Tuberculosis, 5-53; bacilli carried by milk, 5-207; streptomycin in treatment, 1-175.
Tubul (tubul) or **Austral Islands** in S. Pacific; French; area 115 sq. m.; pop. 3,900; 6-28.
Tuck, Friar. Vagabond friar in Robin Hood legends, 6-416.
Tucuche Peak. Highest point (3,100 ft.) in Trinidad, 7-317.
Tucuman (tucumán). Cap. of prov. of Tucuman, in N. Argentina; pop. 152,508; commercial and fly. centre; univ.; declaration of independence from Spain signed by Plata provinces in 1810, 1-223.
Tudeh. Communist party in Persia, 6-132.
Tudor, House of. Line of Eng. kings and queens, 7-323, 4-163.
Tudor Costume, 2-120.
Tudor Rose, 6-153.
Tuesday, 3rd day of week; origin of name, 3-55.
Tufted Duck. A diving duck, 3-131 illus.
Tugela (tugéla). River of Natal S. Africa; length 300 m.
Tuileries (tuileries). Royal palace in Paris; gardens, now a public park; in Fr. Rev., 5-13, 3-168, 6-84 illus. f.
Tula (tula). Cap. of Tula region in cent. Russia; pop. 272,000; mfr. of firearms, sawmills.
Tulip. Plant of family *Liliaceae*, 7-323; bulb, 2-119.
Tulip Tree. Tree of magnolia family, *Liriodendron tulipifera*; one of finest hardwoods; native to N. Amer. It was introduced into Eng. in the 17th cent.; known by its curiously truncated 4- or 6-sided leaves and greenish, tulip-like flowers.
Tull, Jethro (1674-1741). Eng. farmer and writer; inventor of planting drill, 1-78, 4-259.
Tulle (tulle). Picturesque tn. in s. Fr.; pop. 10,000; fine 15th-cent. cath.; from Tulle first came fabric of that name.
Tullus Hostilius. Rom. king, 6-429.
Tulsa, Oklahoma, U.S.A. Fly. and mfg. city in S.E. on Arkansas; pop. 182,710; heart of important oil-field; more than 300 oil and refining companies; natural gas and coal for manufacturing; farming and stock-raising centre.
Tumbler. Variety of pigeon.
Tumbler Lock. Type of lock, 4-536; (Greek, 4-535 illus.).
Turnen. R. of E. Asia dividing Manchuria from part of N. Korea, length about 480 m., 5-112.
Tummel. R. in Perthshire, Scot., flowing 29 m. to join the Tay; also a lake, 24 m. long. The Tummel is dammed at Clunie and Pitlochry to supply hydro-electric power.
Tuna (fish). See **Tunny**.
Tunbridge Wells. Inland spa on Kent and Sussex border, pop. 38,397; medicinal springs; 4-398.
Tundra. Arctic plains with scanty

vegetation, found in N. Asia, 1-261, 6-187; in Siberia, 7-49 illus.; in Russia, 6-173.
Tung Nuts, oil from, 5-487.
Tungsten, or **Wolfram** (W). Chem. element; atomic no. 74; atomic weight 183.92; melting point 3,387°C.; 7-324, 3-221; used in filaments, 3-220; 3-490, 5-177.
Tungsten arcs. Ultra-violet rays artificially produced in, 7-344.
Tunguses. Ural-Altaic people of Siberia and Mongolia, including the Tunguses proper and the Manchus.
Tuning-fork. A steel fork giving a definite pitch when struck, 7-86.
Tunis. Cap. and port of Tunisia, Fr. N. Africa; pop. 361,593; mfrs. include silks, woollens, leather, pottery. About 3 m. N.E. are ruins of Carthage; 7-321, 1-50; in 2nd World War, 7-325, 493.
Tunisia. Country of N. Africa, formerly Fr. protectorate; area 48,195 sq. m.; pop. 3,113,198; 7-324; in 2nd World War, 7-325, 493.
Tunnel, 7-325; Box tunnel through Cotswolds, 7-328; for sea-going barges, 7-326 illus.; under Mersey, 7-328, 327 illus.; in Pennines, 6-118; fly. tunnels in U.K., 6-337; for underground flys., 7-345, 346.
Tunney, Gen. (b. 1808). U.S. boxer; Dempsey fight, 1927, 2-30.
Tunny or **Tuna**. Fish, largest member of mackerel family, 7-328, 3-385.
Tunstall. One of the "Five Towns" now forming Stoke-on-Trent, 7-141.
Tupper, Sir Charles (1821-1915), Canadian statesman; prime min., 1896; one of the fathers of the Confederation of 1867; high commissioner in London 1884-87; 1888-1890.
Turanian. Group of languages including Mongolian, Hungarian, and Finnish, 4-445, 5-239.
Turbine, 7-329, 330 illus.; steam turbine, 7-30.
Turbinia. The first steamer to be driven by the Parsons steam turbine 7-330, 7-39 illus.
Turbit. Breed of domestic pigeons.
Turbo-jet. Type of internal-combustion engine designed by Sir Frank Whittle, 4-371 370 illus.
Turbot. See **Fish** (list).
Turcoomen. People of Uzbek Soviet Socialist Republic, Cent. Asia; habits and dress, 1-273 illus.
Turdidae. Family of birds including robins, wheatears, thrushes and the nightingale, 7-271, 6-115.
Turenne, Henri de la Tour d'Auvergne, Vicomte de (1611-75). Marshal of France, one of the great captains of history whose campaigns Napoleon advised soldiers to "read and re-read"; commanded Fr. armies in many of wars of Louis XIV.; in Thirty Years' War, 7-270; Marlborough and, 5-131.
Turgenev, Ivan Sergeievich (1818-83). Russ. novelist and dramatist; his masterpiece is *Fathers and Sons* (1862); other novels include *Rudin* (1856); *On the Eve* (1860); *Smoke* (1867); 6-490, 5-172.
Turgot (turgot), Anne Robert Jacques, Baron de Laune (1727-81). Fr. statesman and economist, controller-general of France (1774-76) attempted to abolish feudal privilege, 3-466, 5-43.
Turin. City of N. W. Italy, on r. Po; pop. 720,032; centre of Ital. motor industry; 7-331 6-232, 4-304 4-311 illus.
Turkistan (Turkistan). A region of central Asia, 7-331.
Turkistan-Siberian (Turksb) Railway. Opened 1930; 908 m. long; links Trans-Siberian and Trans-Caucasian lines; 6-473, 7-18 illus.
Turkey. Country of Europe and Asia; area 296,000 sq. m.; pop. 20,950,000; 7-332; map, 7-333; flag, 3-384 illus. f.; physical features, 7-332; agriculture, 7-332; industries, 7-336; government, 7-336; people, 7-332; figs. 7-334 illus.; religion, 7-333; Anatolian railway, 1-274; new alphabet, 7-336.
History: 3-311, Byzantine Empire overthrown, 7-333; conquests extended, 7-333; influence in Macedonia and Serbia, 7-318; crusades, 3-1; capture of Constantinople, 2-119; conquest of Cyprus, 3-21; conquest and rule in Egypt, 3-175; conquest and rule in Greece, 4-77; capture of Szigetvár (1566), 7-333 illus.; Russia and Black Sea, 1-481; Greece gains freedom (1829), 7-335; Serbia, 7-335; the "Eastern Question", 7-335; Chinese War, 7-335, 2-332; Young Turk movement, 7-345; Balkan Wars, 7-335; in 1st World War, 7-483, 7-335; Armenia, 1-212; Kemal Atatürk, 4-396, 397, Gk. war of 1921-22, 4-78; treaties of Sevres (1920) and Lausanne (1923), 7-181; caliphate abolished, 7-346; abolished, 7-336; new calendar, 7-336; in 2nd World War, 7-337.
Turkey. Bird, native to North and Central America, 7-332.
Turkey-buzzard, a North Amer. member of the culture group, 2-117.
Turkey Carpet, 2-252 illus. f.; knot, 2-246 illus.
Turkish Bath, 1-385.
Turkish Knight. Character in mumming plays, 3-115.
Turkish Knot. See **Ghiordes Knot**.
Turkish Language and Roman alphabet, 1-120.
Turkish Pound. See **Money** (list).
Turkmenistan. Republic of the U.S.S.R. in cent. Asia; area 189,378 sq. m.; pop. 1,254,000; cap. Ashkhabad; 6-478.
Turks. People; amber and smoking pipes, 1-131; conquest of Arab lands, 1-193; archery, 1-207; in Balkans, 1-350; and Hungary, 4-206; rule in Mesopotamia, 1-339.
Turk's Cap, type of hat, 4-507.
Turks Islands. Group of small isls. among the Bahamas. Together with the Caeos Isls. they constitute a dependency of Jamaica; 4-338.
Turku, or Abo. Fin. of Finland; pop. over 100,000; 3-351.
Turmeric. Plant of the ginger family yielding spice and yellow dye, 4-21, 7-132, 3-111.
Turner, Joseph Mallord William (1775-1851). Brit. painter, 7-337, 3-261; as a landscape painter, 6-34; water-colours, 3-262; drawing technique, 3-123; The Fighting Temeraire, 3-269 illus.; Venice, 7-337 illus.
Turnip. Cabbage like vegetable with edible root, said to have come to Eng. from Holland in 1550; early shoots boiled as greens, 2-151; in crop rotation, 1-78.
Turnpikes, and toll gates, on Eng. roads, 6-405.
Turntable, of gramophone, 4-58.
Turpentine. Oleo-resin secreted by species of pine tree, 7-338, 3-356.
Turpin, Dick (1706-39). Brit. highwayman, subject of many legends and stories, 4-176.
Turquoise (torkwahiz). A precious stone, 7-165.
Turtle-dove. Bird, 6-198; migration 5-204 illus. f.
Turtles. See **Tortoises and Turtles**.
Tuscan dialect, Italy, 4-329.
Tuscany. Dist. in W. Italy, corresponding roughly toanc. Etruria; fertile, rich in minerals; chief port Livorno (Livorno), 4-304.
Tusculum. Anc. city of Latium, 15 m. S.E. of Rome, near modern Frascati; favourite residence of Cicero and other noted Romans.
Tussaud (tussod), Marie (1760-1850). Wax modeller, b. in Switzerland; learned art of wax modelling in Paris; imprisoned during the Revolution; came to England in 1802, and later opened her world-famous exhibition of waxworks, now in Marble Arch Road, London.
Tutankhamen (T. c. 1350 B.C.). Egyptian pharaoh; tomb, 3-198, 187 illus. 3-203; mummy case, 3-203 illus.
Tuttlingen, Ger. Tn. in Land of Baden-Württemberg, pop. 16,000; victory of Austrians and Bavarians over French in 1613 (Thirty Years' War)

TUTTLENGEN

TUTU

Tutu. Very short ballet skirt, 1-351.
Tutulla. Isl. of the Samoan group; area 40 sq. m.; pop. 15,954 (incl. Isl. of Aunu'u). Contains spt. of Pago Pago, seat of govt. of Amer. Samoa; 6-494.
Tuyere. Nozzle of a tube used to blow large volumes of hot or cold air into a blast furnace, 1-483 with diag.
Tyer (tn.; U.S.S.R.). See **Kalinin**.
"Twain, Mark" (S. L. Clemens, 1835-1910). Amer. humorist and novelist, 7-338, 7-365.
Tweed. R. rising in Peebleshire, Scot., and flowing E. 97 m. to Berwick; gives name to tweed cloth; 6-104, 6-461, 6-460.
Tweeddale. Name sometimes given to Peebleshire, Scot., 6-104.
Tweedsmuir, 1st Baron. See **Buchan, John**.
Twelfth Night. Comedy by Shakespeare, 7-339.
Twelve Tables of the Law. The earliest codification of the Roman law; based on old custom; engraved or painted on wood, and placed in the Forum; originally ten in number.
Twenty Thousand Leagues Under the Sea. Story by Jules Verne, 7-393.
Twickenham. Residential tn. of Middlesex on Thames; stadium, h.q. of Brit. Rugby Football Union, pop. 105,645; residence of Alexander Pope, & Horace Walpole, Louis Philippe.
Twilight, how caused, 1-81, 80 diag.
Twilight of the Gods or Ragnarök. In Norse mythology, a time when the world of the gods was to be destroyed. Wagner's opera *Götterdämmerung* is based upon the myth, 5-429; 7-199.
Twill. Textile fabric in which the weft is carried over one and under two or more warp threads, thus producing diagonal lines.
Twine, 7-173.

Twin Falls. Tn. of Idaho, U.S.A., near Snake r.; pop. 17,600; flour mills, creameries.
Twins or Gemini. One of the 12 signs of the Zodiac, 7-324 illus.
Twite. Bird, relative of the linnet, 4-315.
Two Sicilies. Kingdom formed by union of Sicily and Naples (1139) and at times other parts of S. Italy; 7-50.
Two Sisters, Hall of. In the Alhambra, Granada, Spain, 1-111.
Two-stroke engine, 4-271.
Tyburn. Chief place of execution in London until 1783; near N.E. corner of Hyde Park; named from small tributary of Thames.
Tychonic system. System of movement of planets devised by Brahe, 2-39.
Tyler, Wat (d. 1381). Leader of Peasants' Revolt in Eng., 7-339; and Richard II, 6-399, 3-274 illus.
Tyndale, William (1492-1536). Eng. translator of Bible, 7-339, 1-442, 111 illus.
Tyndall, John (1820-93). Brit. physicist; Tyndall blues in animal coloration, 2-463.
Tyne. Riv. of N.E. Eng., formed by union of two streams (the N. and S. Tyne) near Hexham, Northumberland. The N. Tyne rises in Cheviot Hills, Scot.; the S. Tyne rises in Cumberland Pennines. The united river flows E., by Newcastle, Jarrow, Gateshead, to enter sea at Tyne-mouth, 3-139, 5-10.
Tynemouth. Industrial port and holiday resort in Northumberland at mouth of Tyne; pop. 66,541; export trade in coal and coke; fisheries, shipyards, 5-391.
Tyneside. Gt. indus. region on banks of N. Tyne, Northumberland and Durham, Eng., 5-461.
Tynwald. Name for the old parliament of the Isle of Man. Tynwald Hill

ULTIMA THULE

is the place where the laws of the island are promulgated after receiving the royal assent, 5-110.
Type and Typography. 7-338; Aldus Manutius and, 1-98; in early printed books, 2-4; in newspapers, 5-404-403; printing, 6-288.
Type-composing machine. "Linotype," 4-516; "Monotype," 5-216.
Type metal, 5-217, 7-310.
Type-setting, by "Monotype," 5-246.
Typewriter. A hand-operated writing machine, 7-341, 312 illus.; for writing Braille, 1-186.
Typhoon, 7-169, 3-16.
Typhus Fever, 4-15.
Typography. The design, selection, and arrangement of type, 7-349.
Tyrannosaurus. Prehistoric animal, 6-281.
Tyranny. Form of govt. in anc. Greece, 4-76.
Tyre. Anc. Phoenician city on Mediterranean coast, 4-473; dye-industry 6-161.
Tyres, rubber, 6-161; on early motor cars, 6-113; carbon black in rubber, 6-165; cross-section of, 6-166 diag.
Tyrian purple. Dye, 3-111.
Tyrone. Co. of N. Ireland; area 1,214 sq. m.; pop. 132,019; 7-342.
Tyrinthians (people). See **Etruscans**.
Tyrtæus (Tertius) (7th cent. B.C.) (Gk. i. actual poet; legend says, a lame schoolmaster derisively sent by Athenians to Sparta in response to request for a general in 2nd Messenian War; his warlike songs inspired them to victory).
Tyler, James (c. 1717-1804). Brit. balloonist, 1-351.
Tziganes (Tzigahnz') Gypsies of Hungary.
Tzu-Hsi (Tsahsi) (1833-1908). The "Great Empress Dowager" of China and its virtual ruler for half a century.

U

LIKE C and G, and I and J, the letters U, V, W, Y were originally only variations of the same letter. They were all descended, like F, from the Phoenician *wau* or *rau*, which was once the horned asp of Egypt (see the story of F). In Latin for a long time the forms V and U were used without distinction. In most Latin inscriptions up to the end of the 2nd century A.D. no distinction is made between the two. But in the course

of time the form V came to be used by preference at the beginning of a word and the form U elsewhere. As the consonant sound more commonly occurred at the beginning, the form V finally came to denote the consonant and the form U to represent the vowel. The letter has several sounds in English, variously represented in such words as *pull*, *but*, *tube*; and it is often used to modify the sound of another vowel that precedes it, as in *fraud* and *stout*

Ubangi (O'bangi) or **Mbanga.** Chet N. tributary of Congo, formed by junction of Mbomu and Welle; flows S.W. and W. 700 m., forming boundary between Fr. Equatorial Africa and Belgian Congo, 2-180, 181.
Ubangi-Shari. Dist. of Fr. Equat. Africa, between Sudan and Cameroun; area 238,000 sq. m.; pop. 1,000,000; cap. Bangui, 2-482.
U-boat. Eng. name for Ger. submarine (*Unterseeboot*); losses in Battle of the Atlantic, 1-293, 291, 295, 7-181, 482, 487, 488.
Ubon. Town in Siam, 7-15.
Ucayali (akahyah'le). R. of S. Amer., one of main headstreams of Amazon, rising in cent. Peru; flows N. 1,000 m. to John Marañon, 6-138.
Uccello (oocheh'le), **Paolo** (1398-1475). It. painter, 4-317; The Rout of San Romano, 4-322 illus.
Udaipur (udipoor') or **Mewar.** Rajput state in Rajasthan. Rep. of India.
Udall (o'dawil), **Nicholas** (c. 1504-56). Eng. schoolmaster, author of earliest extant Eng. comedy, *Ralph Roister Dwyer*, 3-118, 3-281.
Udine (o'denâ). Cap. of Udine prov., N. Italy; pop. 63,100; makes silk, velvet; trade in wax and hemp.
Udon. Town in Siam, 7-45.

Uffizi Palace. Art gallery in Florence, a former palace of the Medici, 3-392, 5-301.
Uganda. Protectorate in Brit. East Africa; area 93,981 sq. m.; pop. 4,993,965, 7-343, 1-55; granary, 1-53 illus., marriage customs, 5-134.
Ugarit. Anc. site in Syria; modern Ras Shamra; Ugaritic alphabet, 1-119.
Uhland (oo'lahnd), **Johann Ludwig** (1787-1862). Ger. romantic lyric poet, literary historian, and philologist, 4-13.
Uist. See **Hebrides**.
Uitlander (Dutch, foreigner). Name given in Transvaal in 19th century to white men other than Boers; 1-502.
Ujiji (oojij'e) or **Kavele.** Tn. in Tanganyika, E. Africa; pop. 79,300; Stanley finds Livingstone, 7-145.
Ujjain (ooj'in), India. Historic tn. of Gwalior on Sira; pop. 72,729; opium trade; one of 7 sacred cit. of Hindus; marks first meridian of longitude in Hindu geography.
Ukiyoe school. of Jap. art. founded by Iwasa Matahei (1577-1650), 4-353.
Ukraine S.S.R. Area 225,000 sq. m.; pop. 10,000,000; cap. Kiev, 6-479, 4-103; agriculture, 6-472, in 2nd World War, 7-491; people, 6-473.

Ukulele (ûkule'le). A small four-stringed guitar-shaped musical instrument; common in Hawaiian Is.
Ulan Bator. Cap. of Mongolian People's Republic; pop. 100,000, 5-236.
Ulfilas (c. 311-383) (ool'filas). "Little Wolf." Apostle to the Goths, 4-12, 4-49; and Gothic alphabet, 1-440.
Ullswater. Lake on borders of Cumberland and Westmorland, Eng. second in size in the Lake District over 7 m. long, 4-439.
Ulm. Fortress city in Baden-Württemberg, W. Ger., and river port on Danube; pop. 64,000; Gothic cathedral; varied mfrs.; Austrians surrendered to Napoleon (1805).
Ulna, bone, in forearm, 1-114 diag.
Ulnar nerve. One of main nerves of the arm, extending from brachial plexus in neck to various muscles of forearm and fingers. Can be felt as the "funny bone."
Ulster. Anc. prov. of Ireland; the name is sometimes used as an alternative for Northern Ireland, although three counties of Ulster are in Irish Republic; people, 4-281, 5-458, 459 illus.
Ulster King-of-Arms, 4-165.
Ultima Thule. See **Thule**.

ULTRA-MICROSCOPE

Ultra-microscope. Microscope for viewing ultra-microscopic particles, 5-196.

Ultrasonics. Branch of physics concerned with sound waves that cannot be detected by the human ear, 7-343; ultrasonic welding, 7-136; in dry cleaning, 4-455.

Ultra-violet Microscope. Microscope using ultra-violet instead of visible light, 5-196.

Ultra-violet Rays, 7-344; ionizing effects of, 4-277; and ozone, 6-339; wavelength of, 3-221.

Ulungu, Battle of. Zulus under Cetewayo defeated by British in 1879, 7-527.

Ulyanov, Vladimir Ilyich. See Lenin.

Ulyanovsk. Tn. in Russia, formerly Simbirsk, renamed in honour of Lenin whose real name was Ulyanov, 4-478.

Ulysses. Rom. name for Odysseus, (Gk. hero. See *Odysseus*).

Ulysses. Novel by James Joyce, 5-173.

Umbelliferae. The parsley family of plants; flowers radiate in umbrella-shaped clusters; hemlock, 4-161.

Umbilicus. In anatomy, the navel; name also given to stick at each end of papyrus roll, 2-1.

Um'bra. A Latin word, meaning shadow. In astronomy, the darkest part of a shadow in a lunar eclipse; the dark portion of a sunspot is sometimes called the umbra.

Umbrella, 7-344, 345 illus.

Um'bra. A region in cent. It.; until 1860 part of Papal States, 4-301.

Umbrian school, of It. painting, 4-318.

U'me or Umea, r. of Sweden. Rises in S. in mts. on Norway border, flows S.E. more than 200 m. forming several lakes, and enters the Gulf of Bothnia.

Umgani. R. of Natal, S. Africa; falls, 7-93 illus.

Umpire, in cricket, 2-524.

Umpqua. R. in Oregon, U.S.A., about 100 m. long, 5-532.

Unamu'no, Miguel de (1861-1936) Sp. philosopher, poet, and novelist, 7-122.

Uncle Remus. Book of stories about Brer Rabbit, Brer Fox, etc., by Joel Chandler Harris, 2-351.

Uncle Sam. Nickname for the U.S.A.; origin, 5-431.

Uncle Tom's Cabin. Novel by Harriet Beecher Stowe; an indictment of Negro slavery in the U.S.A., 7-364.

Unconscious Mind, Freud's theory, 3-170.

Undergraduate, 7-468.

Underground Railways, 7-345, 316 illus.; counting passing trains by photo-electric devices, 6-161 illus.; in London, 5-24; Metropolitan Ry., 6-351 illus.; signals, 7-52.

Underwater decompression chamber. Tank filled with air at pressure for bringing divers to surface, 3-95.

Underwater television, 7-233, 251 illus.

UNIFORM

Underwriters, at Lloyd's, 4-532.

Undset, Sigrid (1882-1949). Danish novelist; Nobel prizewinner 1928; *Kristen Lavransdatter*; *The Master of Hestrike*. Works show great psychological power and unusual ability to recapture the feeling of another age.

U.N.E.S.C.O. (United Nations Educational, Scientific, and Cultural Organi.). Subod. body of the U.N. set up in Nov. 1945, with representatives of 44 nations including all major powers except U.S.A., to encourage friendship and understanding among nations by exchange of students, teachers, educational methods, etc.

Ungava. Old name of a large part of S. Canada, now included in Quebec prov., 2-202, 6-321. R. M. Ballantyne wrote a boys' book of this title.

Ungula'ta. The group of hoofed mammals; sable antelope, 5-101 illus.

U'niates. Eastern Christians who follow rites of Greek Catholic Church, but acknowledge supremacy of Pope.

U'nicorn. Fabulous beast, usually having head and body of a horse, hind legs of an antelope, tail of a lion, and a long, sharp, twisted horn in the middle of its forehead.

U'nicorn or Monoceros. A constellation, 2-190 diag.

Uniform, in Brit. Army, 1-213, 214, 249 illus.; officers' tied tabs, 1-214; in R.A.F., 6-462.

NOTABLE DATES IN UNITED KINGDOM HISTORY

- 1707. Union of England and Scotland into the United Kingdom of Great Britain.
- 1714. Hanoverian line succeeds to throne in person of George I. Supremacy of Parliament ensured the development of Cabinet government.
- 1745. Rebellion of Stuart adherents ("Jacobites") under Charles Edward Stuart; suppressed.
- 1756 1763. Seven Years' War. Canada conquered; British supremacy established in India.
- 1761. Industrial Revolution begins with invention of spinning jenny.
- 1775 1783. War of American Independence, resulting in loss of 13 American colonies and foundation of United States of America.
- 1788. Colonisation of Australia begun.
- 1793 1815. Wars with revolutionary France and Napoleon (Trafalgar, 1805; Waterloo, 1815).
- 1801. Irish parliament abolished, United Kingdom becoming United Kingdom of Great Britain and Ireland.
- 1806. Cape Colony conquered from Dutch; beginning of British South Africa.
- 1832. Reform Act, giving political power to the middle classes. Many social and political reforms follow: Slavery abolished within British Empire, 1833.
- 1846. "Corn laws" repealed and Free Trade established.
- 1851 1856. Crimean War against Russia in defence of Turkey.
- 1858. Government of India transferred to the Crown.
- 1867. Second Reform Act extends the vote to working men.
- 1870. Beginning of agitation for Irish Home Rule.
- 1877. Queen Victoria proclaimed Empress of India.
- 1882. British occupation of Egypt begins.
- 1899 1902. Boer War in South Africa (Union of South Africa formed, 1900).
- 1911. Parliament Act limits power of House of Lords.
- 1914-1918. First World War (U.K. mobilised 6,211,427 men; 743,702 killed; 1,693,262 wounded).
- 1919-1922. Guerrilla warfare in Ireland, ending with treaty establishing Irish Free State; U.K. now United Kingdom of Great Britain and Northern Ireland.
- 1922. Independence of Egypt recognized.
- 1924. First Labour government (minority) remains in office ten months.
- 1926. General Strike, May 4-12.
- 1931. Economic crisis. Gold standard abandoned. Approximately 3,000,000 unemployed. Statute of Westminster establishes British Commonwealth as free association of free and independent communities, united by common allegiance to the Crown.
- 1939 1945. Second World War. British Commonwealth forces casualties: 452,504 killed and missing; 475,057 wounded. Civilian casualties in U.K. 60,595 killed, 86,182 injured. Battle of Britain, 1940, won by Royal Air Force.
- 1945-1951. Labour governments; nationalisation of coal-mines, transport, gas, and electricity; national health service and full national insurance introduced.
- 1947. India, Pakistan, and Ceylon become dominions of the Commonwealth. Burma becomes independent republic.
- 1949. United Kingdom signs North Atlantic Treaty. India becomes a republic within the Commonwealth. Republic of Ireland proclaimed, independent of the Commonwealth.
- 1950. United Kingdom sends forces to South Korea, to join United Nations in resisting aggression by North Korea. Armistice concluded 1953.

UNIFORMITY

Uniformity, Act of (1849), compulsory use of Prayer Book, 6-280.
Unimak Island, Alaska. Largest of the Aleutians, 1-90.
Union Jack, or Union Flag. Brit. national flag, 7-346, 3-384 illus. f., 4-48, 3-385, 2-465, 406.
Union of Soviet Socialist Republics (U.S.S.R.). See Russia.
Unitarian Church, 3-464.
United Kingdom of Gr. Brit. and N. Ireland. For physical features see under England, N. Ireland, Scotland, Wales; architecture, 1-210; development of the cinema, 2-401; food, 2-50, 2-213; freemasonry, 3-468; National Anthem, 6-325; newspapers, 6-406; Union Jack, 3-385.
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United Nations, 7-354, 7-109; Court of International Justice, 4-118; secretariat building, 1-216 illus., 5-115.
United Provinces (India). See Uttar Pradesh.

United States. Armer. passenger liner, completed 1952, 53,300 tons gross. Fastest Atlantic crossing in 3 days, 10 hrs. 40 mins., average speed 35.59 knots, 1-292, 7-32, 41 illus.

United States of America (U.S.A.). A republic of N. Amer.; area over 3,600,000 sq. m.; pop. over 150,000,000, 7-356 with map f.; flag, 8-383 illus. f.; physical features, 7-356; baseball, 1-377; development of the cinema, 2-395, 396; and gold standard, 4-43; Grand Canyon, 4-80; Greeks in, 4-80; Intelligence tests, 4-272; Jews in, 4-373; libraries, 4-488; Negro pop., 6-362; Red Indian pop., 6-375; slang, 7-65; "The Star Spangled Banner," 5-328.

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STATES OF THE U.S.A.

Alabama	Ala.	North Carolina	N.C.
Arizona	Ariz.	North Dakota	N.Dak.
Arkansas	Ark.	Neb.	Neb.
California	Cal.	Nevada	Nev.
Colorado	Colo.	New Hampshire	N.H.
Connecticut	Conn.	New Jersey	N.J.
Delaware	Del.	New Mexico	N.M.
Florida	Fla.	New York	N.Y.
Georgia	Ga.	Ohio	O.
Iowa	Ia.	Oklahoma	Okla.
Idaho	Ida.	Oregon	Oreg.
Illinois	Ill.	Pennsylvania	Pa.
Indiana	Ind.	Rhode Island	R.I.
Kansas	Kan.	South Carolina	S.C.
Kentucky	Ky.	South Dakota	S.Dak.
Louisiana	La.	Tennessee	Tenn.
Massachusetts	Mass.	Texas	Tex.
Maryland	Md.	Utah	Ut.
Maine	Me.	Vermont	Vt.
Michigan	Mich.	Washington	Wash.
Minnesota	Minn.	West Virginia	W.Va.
Mississippi	Miss.	Wisconsin	Wis.
Missouri	Mo.	Wyoming	Wyo.
Montana	Mont.		

UNIVERSITY

PRESIDENTS OF THE U.S.A.

1789-1797	George Washington	(3 terms)
1797-1801	John Adams	(2 terms)
1801-1809	Thomas Jefferson	(2 terms)
1809-1817	James Madison	(2 terms)
1817-1825	James Monroe	(2 terms)
1825-1829	John Quincy Adams	
1829-1837	Andrew Jackson	(2 terms)
1837-1841	Martin Van Buren	
1841-1841	William Henry Harrison	
1841-1845	John Tyler	
1845-1849	James Knox Polk	
1849-1850	Zachary Taylor	
1850-1853	Millard Fillmore	
1853-1857	Franklin Pierce	
1857-1861	James Buchanan	
1861-1865	Abraham Lincoln	
1865-1869	Andrew Johnson	
1869-1877	Ulysses Simpson Grant	(2 terms)
1877-1881	Rutherford Birchard Hayes	
1881-1881	James Abram Garfield	
1881-1885	Chester Alan Arthur	
1885-1889	Grover Cleveland	
1889-1893	Benjamin Harrison	
1893-1897	Grover Cleveland	(2nd term)
1897-1901	William McKinley	
1901-1909	Theodore Roosevelt	(2 terms)
1909-1913	William Howard Taft	
1913-1921	Woodrow Wilson	(2 terms)
1921-1923	Warren Gamaliel Harding	
1923-1929	Calvin Coolidge	
1929-1933	Herbert Hoover	
1933-1945	Franklin D. Roosevelt	(elected 4 times)
1945-1953	Harry S. Truman	
1953-	Dwight D. Eisenhower	

Jamestown settled, 7-361. Pilgrim Fathers, 6-200; New England colonies, 1-137; Penn founds Penn. sylvania, 6-118; New England confederation, 7-361; Oglethorpe settles Georgia, 7-261; War of Amer. Independence, 1-137; Lafayette, 4-437; Declaration of Independence, 7-361; constitution drawn up 7-361; Jefferson and coinage system 4-358; Louisiana purchase, 4-358, 5-229; Florida ceded to U.S.A., 3-393; Lincoln and civil war, 4-511, 4-333, 4-474, 7-66; Alaska purchase, 1-88; slavery, 7-66; Spanish Amer. War, 4-133, 3-7; annexation of Hawaii, 4-110; and Dominican Republic, 3-107; Pacific possessions, 6-25 map f., 6-31, 32; and Haiti, 4-119; and Panama, 2-459; and Philippines, 6-157; in 1st World War, 7-462; and League of Nations, 4-463; prohibition, 1-96; 7-362; Jap attack on Pearl Harbour, 6-100, 4-350; in 2nd World War, 7-491, 491; anti-submarine warfare, 1-294; atomic bomb, 1-303; Bahaman bases, 1-347, 1-293; lease-lend 4-465; and Europe after 2nd World War, 3-319; N. Atlantic treaty 7-363; Marshall aid, 7-363; fighting in Korea, 7-363.

United States of America. Literature, 7-363.

Unities, The. In drama, 3-121.

Univalves. Molluscs having one shell only, e.g. snail, wrinkle, limpet, 7-24.

Universalists. Christian denomination started in U.S.A. about 1770; central doctrine is belief in final triumph of good and salvation of all mankind.

Universal Postal Union, 6-272, 1-436.

University 7-367; Birmingham, 1-474; Bologna, 7-367; Cambridge, 2-181; Durham, 3-139; Harvard, 4-134; Leyden, 7-367 illus.; Liverpool, 4-625; London, 5-33; Oxford, 6-17; in Rhine valley, 6-391; Paris, 7-368; Rome, 6-429; Sheffield, 7-23.

Wales, 7-413; Zürich, 7-628; hood and coats of arms, 7-frontis; MSS in Middle Ages, 2-3. See lists p. 513-514.

UNIVERSITY COLLEGE

University College, Dublin, 4-285.
University College, London, 5-33;
 Bentham's skeleton, 1-431 illus.
University College, Oxford, 6-17.
University College School, London.
 Founded 1830, 5-28.
University Wits. In hist. of Eng. drama, 3-118, 3-285.
Unknown Warrior. Typical representative of the soldiers of the Allies who were killed in the 1st World War. An unidentified body, taken from a French war cemetery, was buried in a national temple of fame or other place of honour forming the nation's tribute to the fallen. The idea arose in Britain, where the Unknown Warrior was buried in Westminster Abbey on Armistice Day (Nov. 11), 1920; France's Unknown Warrior lies under the Arc de Triomphe, Paris, the U.S.A.'s in the national cemetery at Arlington, Virginia (near Washington); other countries followed the example; in Westminster Abbey, 6-384.

U.N.R.R.A. Initials of United Nations Relief and Rehabilitation Association set up in 1943 to give aid to European peoples exploited by Ger. Saved thousands from starvation Wound up by June 1947.
Unst. Isl. in N. Shetland; most northerly of British Isles; 12 m. long, 2 to 6 m. broad; pop. 1,820; fishing, knitting.
Unter den Linden. Famous thoroughfare in Berlin, Ger., 1-433 illus.
Unto This Last (1880). Book by Ruskin, attacking the materialist philosophy of his age, 6-471
Untouchables. Outcasts, in Hinduism, 4-242.
Upanishads. Hindu ethical writings, 4-230.
Upas Tree. Tropical tree of the mulberry family, 7-313.
Upholstery, for furniture, 3-191; rubber cushions, 6-167 illus.
Uplands, of Scotland; sheep breeding, 6-510.
Upolu. Isl. of the Brit. Western

Samoon group; area 130 sq. m.; contains Apr. cap. of New Zealand Samou; 6-191.
Upper Austria. A prov. in S.W. of Austria; area 1,600 sq. m. pop. 1,107,500. cap. Linz.
Upper Bay. Harbour of New York, U.S.A., 5-412.
Upper Canada. Former name of Quebec prov., Canada, 6-121
Upper Carboniferous Periods, in geology; coal formation in, 2-126.
Upper St. Lawrence Canal, Ontario, Canada, 5-513.
Upper Volta. Fr. overseas territory in W. Africa; area 109,910 sq. m.; pop. 3,217,000; cap. Ouagadougou
Uppingham. Tn. in Rutland, Eng.; has boys' public school founded in 1584; 6-482
Uppsala [upsahl'a] or Upsala. Cath. city of Sweden on r. Favis; univ.; pop. 61,870. 7-201.
Upsilon, v. T (Rom. u, U). 20th letter of Gk. alphabet.
Ur. Anc. city on the bank of the

FAMOUS NAMES IN UNITED STATES LITERATURE

Louisa May Alcott (1832-88), writer of books for children - "Little Women"; "Good Wives"; "Little Men."
Sherwood Anderson (1870-1941), novelist and short-story writer - "Poor White"; "Dark Laughter."
Ambrose Bierce (1842-1914?), short-story writer - "In the Midst of Life"; "Can Such Things Be?"
James Branch Cabell (1879-), novelist and short-story writer - "Jugan"; "Beyond Life"; "Straws and Prayer-Books"; "The Cream of the Jest"
Willis Gather (1870-1947), novelist and short-story writer - "O Pioneers!"; "A Lost Lady"; "Death Comes for the Archbishop"; "Shadows on the Rock"
Robert W. Chambers (1865-1933), novelist - "Cardigan."
Winston Churchill (1871-1947), novelist - "Richard Carvel"; "The Crisis"; "Consolation"; "The Inside of the Cup."
James Fenimore Cooper (1789-1851), novelist - "The Pilot"; "The Last of the Mohicans"; "Deerslayer."
Stephen Crane (1871-1900), novelist - "The Red Badge of Courage"; "The Little Regiment"
Richard Henry Dana, Jr. (1815-82), novelist - "Two Years Before the Mast."
John Dos Passos (1896-), novelist - "Rosenbush to the Road Again"; "Manhattan Transfer."
Theodore Dreiser (1871-1945), novelist - "Sister Carrie"; "Jennie Gerhardt"; "The Genius"; "An American Tragedy"
Peter Finley Dunne (1807-1936), humorist - "Mr. Dooley in Peace and in War"; "Mr. Dooley's Philosophy"
Ralph Waldo Emerson (1803-82), poet and essayist - "Self-Reliance"; "Compensation."
Edna Ferber (1887-), novelist - "So Big"; "Show Boat"; "Amurrah"; "Glant."
John Fiske (1842-1901), historian - "The Critical Period of American History"
Stephen Collins Foster (1826-61), song writer - "My Old Kentucky Home"; "Old Black Joe"; "Swanee River"
Benjamin Franklin (1706-90), prose writer - "Autobiography"; "Poor Richard's Almanac"
Robert Frost (1875-), poet - "A Boy's Will"; "North of Boston"; "West-Running Brook."
Susan Glaspell (1882-1948), novelist and dramatist - "The Inheritors"; "Fidelity"; "Brook Evans."
Zane Grey (1875-1939), novelist - "The Last of the Plainsmen"; "The Lone Star Ranger."
Joel Chandler Harris (1848-1908), short-story writer - "Uncle Remus"; "On the Plantation."
Francis Bret Harte (1839-1902), novelist, poet, and short-story writer - "The Luck of Roaring Camp"; "The Outcasts of Poker Flat."
Nathaniel Hawthorne (1804-64), novelist - "The Scarlet Letter"; "The House of the Seven Gables"; "Tanglewood Tales."
Ernest Hemingway (1898-), novelist - "Farewell Arms"; "For Whom the Bell Tolls"; "The Old Man and the Sea."
O. Henry (Sydney Porter, 1862-1910), short-story writer - "The Four Million"; "The Voice of the City."
Joseph Hergesheimer (1880-1954), novelist - "The Three Black Pennys"; "Ballad"; "Java Head"; "The Limestone Three."
Oliver Wendell Holmes (1809-94), poet and essayist - "The Aristocrat of Breakfast Table"; "The Last Leaf."
Julia Ward Howe (1819-1910), poet and feminist - "Battle Hymn of the Republic"
Fannie Hurst (1889-), novelist and short-story writer - "Humoresque"; "Luminox"; "Five and Ten"
Washington Irving (1783-1859), essayist and historian - "Diedrich Knickerbocker's History of New York"; "The Sketch-Book of Geoffrey Crayon, Gent."

Henry James (1843-1916), novelist - "Daisy Miller"; "The American"; "The Portrait of a Lady"; "The Wings of a Dove"; "The Turn of the Screw"
William James (1842-1910), philosopher and psychologist - "Principles of Psychology"; "Pragmatism"; "Varieties of Religious Experience"
Ring Lardner (1885-1933), short-story writer and humorist - "You Know Me, Al?"; "How to Write Short Stories"
Sinclair Lewis (1885-1955), novelist - "Main Street"; "Babbitt"; "Arrowsmith"; "Dodsworth"
Vachel Lindsay (1879-1931), poet - "The Congo"; "General William Booth Enters into Heaven"
Walter Lippman (1889-), social philosopher - "A Preface to Morals"; "A Preface to Politics"
Jack London (1876-1916), novelist - "The Call of the Wild"; "The Sea Wolf"; "White Fang"; "Martin Eden"; "The Valley of the Moon."
Henry Wadsworth Longfellow (1797-82), poet - "Hawthorne"; "Evangeline"; "The Courtship of Miles Standish"
James Russell Lowell (1819-91), poet, essayist, and critic - "The Biglow Papers"; "The Vision of Sir Launfal"
Don Marquis (1878-1937), humorist and poet - "The Old Soak"; "Archy and Mehitabel"
Edgar Lee Masters (1869-1950), novelist and poet - "Spoon River Anthology"; "Children of the Market Place"
Herman Melville (1819-91), novelist - "Typee"; "Omoo"; "White-Jacket"; "Moby Dick"
Henry Louis Mencken (1880-1956), essayist and critic - "Prejudices"; "The American Language"
Edna St. Vincent Millay (1892-1950), poet - "Renascence"; "The Ballad of the Harp-Weaver"; "Fatal Interview"
John Lothrop Motley (1814-77), historian and novelist - "The Rise of the Dutch Republic"; "Morton's Hope"
Frank Norris (1870-1902), novelist - "The Octopus"; "The Pit"
Edgar Allan Poe (1809-49), poet, critic, and short-story writer - "The Raven"; "Annabel Lee"; "The Poetic Principle"; "Tales of the Grotesque and Arabesque"
Ezra Pound (1886-), poet and critic - "Lustra"; "Umbra"; "Personae"
William Hickling Prescott (1796-1859), historian - "Conquest of Mexico"; "Conquest of Peru"
Edwin Arlington Robinson (1869-1935), poet - "The Man Who Died Twice"; "Tristram"; "Merlin"
Upton Sinclair (1878-), novelist - "The Jungle"; "Oil"; "Wet Parade"; "Dragon's Teeth"
John Smith (1580-1631), historian - "True Relation of Virginia"; "General History of Virginia"
Harriet Beecher Stowe (1811-96), novelist - "Uncle Tom's Cabin"
Booth Tarkington (1869-1946), novelist - "Monsieur Beaucaire"; "Penrod"
Henry David Thoreau (1817-62), naturalist and essayist - "Walden, or Life in the Woods"; "Excursions"
Mark Twain (Samuel L. Clemens, 1835-1910), humorist - "The Innocents Abroad"; "The Adventures of Tom Sawyer"; "Huckleberry Finn."
Carl Van Vechten (1880-), novelist and critic - "Peter Whiffle"; "The Merry-go-Round"
Artemus Ward (Charles Farrar Browne, 1834-67), humorist - "Artemus Ward His Book"
Edith Wharton (1862-1937), novelist and short-story writer - "Ethan Frome"; "The Custom of the Country"; "The Age of Innocence"; "The House of Mirth."
Walt Whitman (1819-92), poet - "Leaves of Grass"; "Drum Taps"; "November Boughs"
John Greenleaf Whittier (1807-92), poet - "Maud Muller"; "Barbara Fritchie"
Thornton Wilder (1897-), novelist and dramatist - "The Bridge of San Luis Rey."

UNIVERSITIES AND COLLEGES OF THE BRITISH ISLES

ENGLAND

OXFORD

All Souls (1438).
Balliol (1263).
Brasenose (1509).
Christ Church (1546).
Corpus Christi (1517).
Exeter (1314).
Hertford (1874).
Jesus (1571).
Keble (1870).
Lincoln (1427).
Magdalen (1458).
Merton (1264).
New College (1379).
Nuffield (1937).
Oriel (1326).
Pembroke (1624).
Queen's (1340).

St. Antony's (1950).
St. John's (1555).
Trinity (1554).
University (1249).
Wadham (1610).
Worcester (1714).
St. Edmund Hall (c. 1238).
Campion Hall.
St. Benet's Hall.
St. Catherine's Society (1868).
St. Peter's Hall (1928).

Women's

Lady Margaret Hall (1878).
St. Anne's (1952).
St. Hilda's (1893).
St. Hugh's (1886).
Somerville (1879).

LONDON

Birkbeck College (1823).
King's College (1829).
Queen Mary College (1915).
University College (1826).
Wye College (1894).
Bedford College for Women (1849).
Royal Holloway College (women) (1886).
W. St. Field College (women) (1882).
Goldsmith's College.
Imperial College of Science and Technology:
Royal College of Science.
Royal School of Mines.
City and Guilds Engineering College.
Courtauld Institute of Art.
Institute of Advanced Legal Studies.
Institute of Archaeology.

Institute of Commonwealth Studies.
Institute of Education.
Institute of Germanic Languages and Literature.
Institute of Historical Research.
Queen Elizabeth's College of Household and Social Science.
London School of Economics.
Royal Veterinary College and Hospital.
School of Oriental Studies.
School of Pharmacy.
School of Slavonic Studies.
University Observatory, Mill Hill.
Warburg Institute.
Theological.
King's College.
London College of Divinity.
New College.
Richmond College.

UNIVERSITY COLLEGES

Leicester (1918).

North Staffordshire (1949).

WALES

University College of Wales (Aberystwyth) (1872).
University College of N. Wales (Bangor) (1885).
University College of S. Wales and Monmouthshire (Cardiff) (1883).
University College of Swansea (1920).
Welsh National School of Medicine (Cardiff).
St. David's College, Lampeter (1827).

SCOTLAND

St. Andrews (1411).
United College of St. Salvator and St. Leonard.
College of St. Mary.
University College, Dundee.
Conjoint Medical School, Dundee.
Glasgow (1451).
Aberdeen (1494).
Edinburgh (1583).

UNIVERSITY COLLEGE

Glasgow Royal Technical College (1796).

CAMBRIDGE

Christ's (1506).
Clare (1326).
Corpus Christi (1352).
Downing (1800).
Emmanuel (1584).
Gonville and Caius (1348).
Jesus (1496).
King's (1441).
Magdalene (1542).
Pembroke (1347).
Peterhouse (1284).
Queens' (1448).
St. Catharine's (1473).
St. John's (1511).
Solwyn (1882).
Sidney Sussex (1596).
Trinity (1546).
Trinity Hall (1350).
Fitzwilliam House (1869).

Women's

Girton (1869).
Newnham (1871).
New Hall (1954).

DURHAM

University College, Durham (1832).
King's College, Newcastle (1937).
Bede College, Durham.
Hatfield College, Durham.
St. Chad's College, Durham.
St. John's College, Durham.
Neville's Cross College (women).
St. Hild's College (women).
St. Cuthbert's Society.
St. Aidan's Society (women).

Birmingham (1900).

Bristol (1909). Exeter (1955).

Hull (1954). Leeds (1904).

Liverpool (1903).

Manchester (Victoria) (1880).

Nottingham (1948).

Reading (1928). Sheffield (1905).

Southampton (1952).

NORTHERN IRELAND

Queen's University of Belfast (1845).
Magee University College, Londonderry (1865).

IRISH REPUBLIC

University of Dublin, Trinity College (1592).
National University (1909).
University College, Cork (1845).
University College, Dublin (1909).
University College, Galway (1849).

UNIVERSITIES & COLLEGES OF THE COMMONWEALTH

AUSTRALIA

Adelaide (1874).
Melbourne (1853).
National University, Canberra (1946).
New South Wales University of Technology (1948)
Queensland, Brisbane (1909).
Sydney (1850).
Tasmania (1890).
Western Australia, Perth (1911).

CANADA

Acadia, Nova Scotia (1838).
Dalhousie, Halifax (1818).
Laval, Quebec (1852).
McGill, Montreal (1821).
Montreal (1876).
New Brunswick (1800).
Ottawa (1848).
Queen's, Kingston (1841).
Toronto (1827).

UNION OF SOUTH AFRICA

Cape Town (1918).
Natal University (1948)
Orange Free State (1948)
Potchefstroom (1931).
Pretoria (1930).
Rhodes (1951).
South Africa, Pretoria (1873).
Stellenbosch (1916).
Witwatersrand, Johannesburg (1921).

NEW ZEALAND

Auckland University College (1882).
Canterbury University College (1873).
Otago, Dunedin (1869).
University of N.Z., Wellington (1870).
Victoria University College (1897)

CEYLON

University of Ceylon (1942)

HONGKONG

University of Hongkong (1911)

NIGERIA

Ibadan University College (1948)

MALAYA

University of Malaya (1949)

GOLD COAST

University College of the Gold Coast (1948)

EAST AFRICA

Makerere University College (1947)

WEST INDIES

University College Jamaica (1944)

MALTA

Royal University (1760)

INDIA

A'garh (1920)
Allahabad (1887)
Andhra (1926)
Annamalai (1920)
Benares (1918)
Bombay (1857)
Calcutta (1857)
Delhi (1922)
Gauhati (1918)
Jammu and Kashmir (1948)
Karnatch (1950)
Lucknow (1920)
Madhya Bharat (1918)
Madras (1857)
Mysore (1916)
Nagpur (1923)
Osmania (1918)
Patna (1917)
Poona (1948)
Punjab (1947)
Rajputana (1947).
Roorkee (1918)
Saugor (1906)
Travancore (1937)
Utkal (1943)
Women's, Bombay (1919)

PAKISTAN

Dacca (1921)
Karachi (1950)
Peshawar (1950)
Punjab (1882)
Sind (1947)

SOME UNIVERSITIES OF OTHER COUNTRIES

UNITED STATES

California, Berkeley (1868).
Columbia, New York (1754).
Cornell, Ithaca (1865).
Harvard, Cambridge (1636).
Johns Hopkins, Baltimore (1876)
New York, N.Y. City (1831).
Notre Dame, South Bend (1842).
Pennsylvania, Philadelphia (1740)
Princeton, Princeton (1746).
Stanford, Palo Alto (1885).
William and Mary, Williamsburg (1693).
Yale, New Haven (1701).

BELGIUM

Brussels (1834).
Ghent (1816).
Louvain (1426).

FRANCE

Aix-Marseilles (1409).
Besançon (1485).
Bordeaux (1441).
Grenoble (1339).
Montpellier (1289).
Paris (1150).
Strasbourg (1567)
Toulouse (1230).

GERMANY

Bonn (1818).
Gottingen (1734).
Heidelberg (1386).
Jena (1577).
Leipzig (1400).
Munich (1472).
Tubingen (1477).

ITALY

Bologna (1200).
Genoa (1243).
Macerata (1290).
Naples (1224).
Padua (1222).
Perugia (1276).
Rome (1303).
Siena (1300).

NETHERLANDS

Amsterdam (1877).
Groningen (1614).
Leiden (1575).
Utrecht (1636).

NORWAY

Bergen (1946).
Oslo (1811).

PORTUGAL

Coimbra (1290).
Lisbon (1911).
Oporto (1911).

SPAIN

Barcelona (1450).
Madrid (1836)
Oviedo (1317).
Salamanca (1230).
Santiago (1501).
Saragossa (1174).
Seville (1502).
Valencia (1245).
Valladolid (1346).

SWEDEN

Uppsala (1477).
Lund (1668).

SWITZERLAND

Basle (1460).
Berne (1834).
Fribourg (1889).
Genève (1892).
Lausanne (1890).
Zurich (1833).

URAL ALTAIC

Euphrates in Mesopotamia (Iraq). 7-369; Abraham and, 1-3.
Ural Altaic. Group of languages. 6-158.
Ural Mountains. Longest mountain chain in Europe (about 1,600 miles), forming part of boundary between Europe and Asia, 7-369, 8-309, 8-231, 6-472.
Ural River, in s.e. Russia; rises on E. slope of Ural Mts.; flows w. and s. 1,485 m. into Caspian Sea.
Urania. In Gk. myth., Muse of astronomy, 5-299.
Uranium (U). Chemical element; atomic no. 92; atomic weight 238.07; melting point 1,639° C.; 7-370, 3-234; nuclear fission of, 1-306, 301; isotopes, 4-301; radioactivity, 6-351; in Australia, 1-320; in S. Africa, 7-88; in Canada, 2-127, 8-202, 6-513.
Uranus. In Gk. myth., the first ruler of the world, 7-370.
Uranus. The 7th planet in distance from the sun, 7-370; discovery, 8-213; atmosphere of, 1-82; in solar system, 1-282, 278 diag.
Urban. Pope. See **Popes** (list).
Urban II. Pope, 1088-99; and First Crusade, 3-1.
Urban. District. Unit of local govt., 4-52.
Urbino (dorbéno). Tn. in cent. Ital.; pop. 20,500; cap. of former duchy of Urbino; celebrated centre of art and literature in 16th and 18th cents.; birthplace of Raphael, now a museum; beautiful palace.
Urdu. Written form of Hindustani (q.v.).
Ure. R. of Yorks, Eng.; source in the Pennines; flows through Wensleydale (also called Yorkdale) and joins the Swale to form Yorkshire Ouse; 50 m. long, 7-613.
Urea. Principal solid in mammalian urine; the first organic substance to be prepared artificially (in 1828 by Wöhler), and now used for a number of industrial purposes.
Ureter, in anatomy; and kidneys, 4-433.
Urey, Harold Clayton (b. 1893). Amer. scientist. Professor of chemistry at Columbia Univ., New York (1929). His work there led to the isolation of the isotope of hydrogen and the preparation of "heavy" water. Nobel prize for chemistry in 1934.
Urgel, Spain; bishops of, and Andorra, 1-149.

VALAIS

Uri (örfé). Swiss canton, s. of Lake Lucerne; area 439 sq. m.; pop. 28,556.
Uriah (ur'ia). Officer in David's army, husband of Bathsheba; sent by David to be killed in battle (2 Sam. xi).
Urim and Thum'mim. Obscure term applied to a mode of divination among the anc. Hebrews; perhaps two pebbles or bone tablets of contrary import used in casting lots; sometimes mentioned as being carried in a pouch on the high priest's breast.
Urina. The excretion of the kidneys; contains nitrogenous substances including urea, 4-403.
Urmia. Tn. of N.W. Persia; pop. 35,000; traditional birthplace of Zoroaster; Armenians massacred by Turks (1915); raisins exported.
Urguhart (8'46'). Sir Thomas (c. 1611-c. 1660). Scot. writer and soldier; fought against the Covenanters and then fled to Eng. where Charles I knighted him in 1641; taken prisoner by the Roundheads. Wrote *Epigrams*; best known for fine translation of Rabelais.
Urr, Loch. Lake on borders of Dumfriesshire and Kirkcudbrightshire, Scot., 3-134.
Ursa Major or Great Bear. A constellation, 2-489, 490 diag.; nebula in, 5-380 illus.
Ursa Minor or Little Bear. Constellation, 2-489, 496 diag.
Ur'sula. St. (3rd or 5th cent. A.D.). Legendary virgin martyr; said to have been massacred with 11,000 companions by the Huns; and Cologne, 2-456; shrine at Bruges, 2-97.
Ursulae. Rom. Cath. religious congregations of women. Chief one was that of St. Angela Merici of Brescia (1470-1540) primarily for education of girls and care of sick; patron St. Ursula.
Urticaceae (ur'tik'sid) or Nettle family. Family of herbs and vines with hairy stems and primitive flowers.
Urticaria is the scientific name for the disease popularly called nettle-rash.
Uruguay. Republic of S. Amer.; area 72,129 sq. m.; pop. 2,353,000; 7-370, 371 illus. flag, 3-385 illus. f.
Uruguay. R. of S. Amer. rising in s.e. Brazil and flowing 1,000 m. to r. Plata; boundary between

Argentina on w. and Brazil and Uruguay on e.; 7-370, 371, 1-224.
Ushant (Fr. Ouessant). Fr., fortified, rocky, often fog-bound island; off coast of Brittany; 44 m. long; pop. 3,000; indecisive naval action off Ushant between British and French (1778).
Ush. R. of Carmarthenshire, Breconshire and Monmouthshire; flows 70 m. to Bristol Channel; salmon and trout fishing; 5-246.
Usti nad Labem. Czechoslovakia. City in Bohemia on Elbe; pop. 43,800; coal traffic; chemicals.
Usury. Originally interest payable on a loan; later, extortionate interest; medieval view of, 1-363.
Utah. State of U.S.A.; area 84,916 sq. m.; pop. 688,862; cap. Salt Lake City; 7-371; Mormons in, 2-264.
Utah Lake. Largest fresh-water lake in Utah, U.S.A.; 23 m. long.
Utamaro (otahmah'rō), Kitagawa (1754-1806). Japanese designer of colour-prints; called "great master of the popular school."
Uther Pendragon. King. Legendary father of King Arthur, 1-238.
Utica. Anc. Phoenician city on N. coast of Africa; sided with Rome in Third Punic War and succeeded Carthage as leading city of Africa; scene of last stand of Pompeians against Caesar and of suicide of younger Cato (46 B.C.).
Utilitarianism, in philosophy. Those whose maxim was "the greatest happiness of the greatest number," also called Benthamites. after Jeremy Bentham, 1-130, 6-159, Mill and, 5-207.
Utopia. A romance by Sir Thomas More describing an ideal commonwealth, 5-262.
Utrecht. City in the Netherlands, pop. 195,121; 7-372, 5-372, 371 illus.; Declaration of, 6-61.
Utrecht, Treaty of (1713) ending European War of Spanish Succession. 7-372, 5-42, 5-132.
Uttar Pradesh (Union). State of Republic of India; area 112,523 sq. m.; pop. 63,254,178; cap. Lucknow; 7-372, 4-211, 1-69.
Uxmal (ōōsmahl'), Mexico. Anc. ruined city in s.w. Yucatan; remarkable remains of Maya architecture.
Uzbekistan. Republic of the U.S.S.R. in cent. Asia; area 159,170 sq. m.; pop. 6,300,000; cap. Tashkent, 6-479; Turcomen, 1-273 illus.

V

IN inscriptions on stone, on memorial tablets and public buildings, U is even to-day very frequently made in the shape of a V. This gives the inscription an air of antiquity, for the U was originally made in that way on Greek and Roman inscriptions, since it was easier to cut with the chisel. The story of how the two letters V and U developed is told under U. The characters V and U were used for the same sound in Latin, Norman-

French, and English as late as the Elizabethan period and were counted as one in alphabetic arrangements. V was commonly called "single U" as W was "double U," until the early 17th cent. The sound of v in Latin was like our w. V is pronounced in English with the upper teeth touching the lower lip. In Spanish, and to some extent in German, V is pronounced with lips stiffened and brought together, teeth not being involved at all

V1. Ger. long-range rocket bomb of 2nd World War, 6-423, 7-495.
Vaagso. Is. of Norway, 100 m. N. of Bergen; Ger. radio station and refuelling base in 2nd World War; combined British and Norwegian forces landed Dec. 27, 1941, and destroyed installations and Ger. garrison.
Vaal (vahl) (Dutch, "yellow"). R. in S. Africa, rises on w. slope of Drakensberg; flows w. 500 m. to Orange r., of which it is chief tributary, 5-594, 3-33 illus., 7-91.
Vaccination. A form of inoculation against disease, 7-373; Jenner and, 4-361.

Vaccinium, cranberry and bilberry genus of plants, of family *Ericaceae*; bilberry, 1-445.
Vachell, Horace Annasley (1861-1955). Brit. novelist and dramatist (*The Hill*; *John Charity*; *Quinnys*).
Vaclav. See *Wenceslas*.
Vacuum, 7-373; process for concentrating salt, 6-492; and X-ray tube, 7-507.
Vacuum Brake, 2-44, 43 diag.; 6-231.
Vacuum Cleaner, as a pneumatic machine, 6-231; electric motor 5-276 illus.
Vacuum Flask, 7-373.
Vacuum Tube. Alternative name for thermionic valve (q.v.).

Vaduz. Cap. of the principality of Liechtenstein, pop. 2,772; 4-491.
Vagus (vā'gus) or *pneumogastric Nerve*. Mixed nerve descending from medulla oblongata through the carotid sheath and branching to the various internal organs; also called the tenth cranial nerve, 4-145.
Vallima. Home of Robert Louis Stevenson on Upolu isl., Samoa 6-494.
Valisay. Hindu farmer caste. 1-262 4-178, 4-242.
Valais (val'si). Canton of s.w. Switzerland, 2,000 sq. m.; pop. 159,174; great Alpine peaks; tourist resort; many minerals, and wines well

VALDAI HILLS

known, but most of area is pastoral; 7-213 illus. f.

Valdai (val'dai) Hills, Rus. Groups of low hills and plateaux midway between Leningrad and Moscow; watershed for chief river systems of W. European Russia; 800 to 900 ft.

Val de Travers, Gorge in Jura mts., leading from Fr. into Switz., 4-388; road asphalt from, 1-275.

Valdes, Don Pedro de (17th cent.), Span. general; distinguished himself as a sea captain. Became captain-general of Cuba; waged war against pirates; captured by Drake, 3-113 illus.

Valencia (valahns') (Rom. Valencia), Fr. Historic tn. on Rhône; pop. 28,000; printed fabrics, flour, tinned foods; vineyards, 6-386.

Valencia, Cap. of Valencia prov., Spain, pop. 509,075; 7-373, 374 illus., 7-103, 104, 107 illus.

Valencia Almond, 1-118.

Valenciennes (valahnayen'), Fr. Industrial tn. on r. Scheldt in coal district; pop. 38,684; famous lace no longer made here.

Valenciennes Lace, 4-432 illus. f.

Valency (val'ensal), Combining power of a chemical element or group; the ratio of the atomic weight to the combining weight of the element; indicated by the number of hydrogen atoms with which the atom can combine or which it can replace; 2-317, 318, 1-297.

Valens (c. 328-378), Byzantine emperor, chosen in 364 by his brother Valentinian I to rule East; warred with Persians and Goths; death at battle of Adrianople (378), 4-19.

Valentine, St. Christian martyr of 3rd cent., whose feast day falls on Feb. 11; 7-374.

Valentine, Greeting card commemorating St. Valentine's Day (Feb. 14), 7-374, 375 illus.

Valentinian I (321-375), Rom. emperor, son of humble parents, who rose to high rank in army and was elected emperor in 364; a firm, impartial ruler.

Valentinian II (A.D. 371-392), Rom. emperor; ruled over It., Illyria, and Africa, while his brother Gratian ruled the Gallic provs.; on assassination of Gratian in 393, Valentinian governed the whole empire of the West, assisted by Theodosius; assassinated at Vienna.

Valentinian III (c. 419-455), Rom. emperor, succeeded in 425, during whose reign Africa, Sicily, Gaul, and Britain were lost; murdered Aetius and was himself murdered following year.

Valentino, Rudolph (1895-1926), Italo-Amer. film actor; *The Four Horsemen of the Apocalypse*, *The Sheik*, *Monsieur Beaucaire*, etc.

Valera, Eamon de. See **De Valera**.

Valera y Alcalá Galiano, Juan (1824-1905), Span. novelist and diplomatist; his *Pepita Jimenez* is regarded as a classic.

Valerian (Publius Licinius Valerianus), Rom. emperor 253-260, elected by army when he was over 60; zealous worker but overwhelmed by constant fighting with barbarians and Persians; defeated by Persians A.D. 260 and held prisoner until his death.

Valerian Way, A principal highway of anc. It.; continued Tiburtina Way (Rome to Tivoli) N.E. to Adriatic.

Valerius (270-325), Rom. emperor, defeated Maximus and became sole ruler in East; executed for treason.

Valéry, Paul (1871-1945), Fr. poet and essayist (*La Jeune Parque*; *Eupalinos*; *Regards sur le Monde Actuel*).

Valhalla, In Norse myth., palace in Asgard where warrior heroes who were slain in battle feasted and fought, 5-500.

Valkyries (valk'ri'ez), "Choosers of the slain," in Norse myth., maidens who conduct souls of slain heroes to Valhalla. For Wagner's opera see *Walküre*.

Valla, Lorenzo (c. 1400-57), It. scholar, writer of many works of

history, criticism, and moral philosophy; and revival of Grk. learning, 4-313.

Valladolid (valihyah'dólah'), Spain. Former cap., 95 m. N.W. of Madrid; est. pop. 135,780; Columbus died here; home of Cervantes, birthplace of Philip II; varied mtrk.; univ.

Vallée-Incien, Ramón María del (1870-1935), Span. novelist, 7-122.

Valetta, Cap. and harbour of Malta; pop. 18,866; 5-98, 99 illus.

Valley, 7-375; 6-188, 187 illus.

Valley Forge, Pennsylvania, U.S.A. VII. on Schuylkill r., 90 m. N.W. of Philadelphia; winter quarters of Washington's army (1777-78), 1-139.

Valley of the Kings, Valley in Egypt nr. Thebes. Contains tombs of XVIIIth-XXth dynasty of anc. Egyptian kings.

Vallombrosa ("hady valley"), It. summer resort in Apennines; famed for its leafy groves alluded to by Milton in *Paradise Lost*.

Valmy (val'mé), Fr. vil.; battle between army of Fr. Rev. govt. and First Coalition (1792), 3-469.

Valois, House of, Fr. dynasty, branch of Capetian family; reigned 1328-1589; began with Philip VI, 2-450. See also list of rulers of France under **France**.

Valois, Dame Ninette de (b. 1898), Brit. dancer and choreographer. Real name Edrie Stannus. Director of Vic-Wells ballet from 1931, 1-352.

Valois, Old dist. of N.-west France, now comprised in départements of Oise and Aisne; countyship in Middle Ages; later united to crown; home of House of Valois.

Valona, or Vlene, Chief port of Albania; pop. 6,500.

Valparaiso, City and chief pt. of Chile; pop. 260,000; 7-375, 2-300, 6-198; Viña del Mar, 2-359 illus.

Vallée (val'hé'el), Fertile upper valley of r. Adda in N. It., much fought over by anc. and medieval powers; wines and honey; mineral springs; ruled by Austria 1814-59.

Valve, 7-376, 377 illus.; in brass musical instruments, 4-194; electric, principle and uses, 3-222; thermionic, 6-346, 340 illus. f., 7-376, 378 diag.; triode, 7-377.

Valve gear, of locomotive, 5-2.

Vambraces, In armour, 1-241.

Vampire, Legendary demon supposed to suck the blood of sleeping persons.

Vampire Bat, in Cent. and S. Amer., 1-382.

Van, Lake. Large salt lake of Turkey; area 1,400 sq. m.; no outlet.

Vanadium (V), Brittle, grey-white metallic element of the tantalum group; atomic no. 23; atomic weight 50.95; melts at 1,720° C.; 7-378, 3-224.

Vanbrugh (van'bre), Dame Irene (1872-1949), Brit. actress; won fame in *The Gay Lord Quex*; acted in social comedies *Admirable Crichton*, *Mr. Pim Passes By*, *All The King's Horses*.

Vanbrugh, Sir John (1664-1726), Eng. dramatist and architect, one of leading wits of his day; designed Blenheim Palace and other mansions; 3-121, 3-287.

Vanbrugh, Violet (1867-1942), Brit. actress, sister of Irene; played in Shakespeare and later portrayed society women, farcical and otherwise.

Vancouver (vankóv'vél), George (c. 1758-98), Brit. navigator, served under Cook on 2nd and 3rd voyages; explored Vancouver Isl.; 7-379.

Vancouver, City and pt. of Brit. Columbia, Canada; pop. 344,833; 7-378, 2-80, 82.

Vancouver Island, Brit. Columbia, largest is. off W. coast of Amer.; area 12,408 sq. m.; pop. 150,400; chief city, Victoria, cap. of Brit. Columbia, 7-379, 2-80, 2-200.

Vandals, Germanic tribe, 7-379, 3-313; migrations, 5-204; in N. Africa, 5-199; capture of Carthage (439), 2-255; in Morocco, 5-265; and Andalusia, 7-105.

VARNHAGEN

Van de Graaff machine, 3-17.

Van'derbilt, Cornelius (1794-1877), Amer. capitalist and financier; founder of the Vanderbilt fortune; nicknamed "Commodore" for his early steamboat activities; acquired control of New York Central Railroad, to which his son, W. A. Vanderbilt, and grandsons added other important railway systems.

Van Diemen's (dó'menz') Land, Former name of Tasmania.

Van Dyck, Sir Anthony (1599-1641), Flemish master of portraiture, 7-379, 5-382, 6-34, 8-259; pupil of Rubens, 6-468.

Vane, Sir Henry (1590-1655), Eng. statesman; one of the principal advisers of Charles I, he was made sec. of state (1640); played a leading part in impeachment of Strafford, suspected of betraying the King's cause, he was dismissed the royal service and became a supporter of the Parliamentary cause.

Vane, Sir Henry (1613-62), Eng. Puritan statesman, son of the preceding; gov. of Massachusetts 1636-37; returned to England; active Parliamentarian; imprisoned at Restoration and beheaded for treason.

Väner or Vener Lake (väner), Largest in Scandinavian peninsula and 3rd largest in Europe; area 2,000 sq. m.

Van Eyck (ik), Hubert (c. 1368-1426), and Jan (c. 1395-1440), Flemish painters, 7-380; 5-381, 4-10; portrait of Arnolfini, 5-381 illus.; "Adoration of the Lamb," 5-386 illus.

Van Gogh, Vincent (1853-90), Dutch painter, 7-381, 3-440.

Vanguard, H.M.S., Brit. battleship, built 1911-45; 50,000 tons; length 314 ft., beam 107 ft., Earl of Vanguard blew up in 1917 at Scapa Flow, with loss of 627 lives; 5-311 illus.

Vanilla, Flavouring substance used in baking and confectionery; also used in making perfumes, 7-381; from cloves, 2-423; beans, 7-131 illus.

Vanity Fair, Novel by Thackeray, 7-261. The title was taken from Bunyan's *Pilgrim's Progress*, in which Vanity Fair was visited by Christian and Faithful on their pilgrimage to Zion, and was found to be a place of worldly temptation.

Vannes (van), France. Quaint old tn. 67 m. N.W. of Nantes; pop. 28,180; anc. cap. Veneti, taken by Caesar 56 B.C.; rich prehistoric remains.

Van't Hoff (vahnt'hóf'), Jacobus Hendricus (1852-1911), Dutch chemist and physicist, founder of stereochemistry and first Nobel prize winner (1901) in chemistry.

Vanua Levu (vah'vua lé'vó), One of Fiji Is.; area 2,130 sq. m.; 2-351.

Vapour, Gaseous form of a substance below its critical temperature, so that it can exist in equilibrium with the liquid or solid; behaviour as gas, 3-510; water vapour in air, 7-427.

Varanger (vahrang'gér) Fjord, Inlet in Norway.

Varangians, Slav. name for the Norse invaders of Russia (9th cent.).

Vardon, Harry (1870-1937), British golfer; winner of Eng. open championship 1896, 1898, 1899, 1903, 1911, 1914; published *The Complete Golfer*, *How to Play Golf*, and *My Golfing Life*; 4-44.

Varennes-en-Argonne (varens'ahn-ahrgón'), Small tn. of France, on Airo r.; Louis XVI and family captured, 5-126.

Vargas, Luis de (1502-68), Span. painter, 7-112.

Vargas diamond, Third largest known diamond, found at Minas Geraes, Brazil, in 1938, 3-85.

Variogated Laurel, Alternative name for Japanese laurel, 4-455.

Var'na (or Stalin), Chief port of Bulgaria, on Black Sea; pop. 98,000; anc. Odessos; cotton mills; exports cattle, grain; 2-119.

Varnhagen von Ense (fahn'hahgen fon 'ensé), Rahel (1771-1833), Ger. author remembered for her letters and for her influence on A. von

VARNISH

Humboldt, Goethe, Carlyle, and other literary men; her salon in Berlin was the most important in Germany; her husband, Karl (1786-1858), wrote historical and literary sketches of permanent value.

Varnish, 7-381; on oil paintings, 6-37, rosin in, 6-389.

Varro [var'ō], Marcus Terentius (116-28 B.C.), Rom. historian and soldier; "most learned of the Romans"; only his works on the Latin language and on agriculture now exist.

Varuna, Hindu god; introduced by Aryans, 4-251.

Varus, Publius Quinctilius (d. A.D. 9), Rom. general whose defeat by Arminius in the Teutoburg Forest (A.D. 9) limited Rom. empire to the Rhine. Varus killed himself in despair, and the Emperor Augustus cried in anguish at the news: "Varus, Varus give me back my legions!"

Vasa [vah'sā], Swedish royal house beginning with Gustavus I 1523, and ending with Christina 1654. For list see Sweden.

Vasari [vasah'rī] Giorgio (1511-74), It. author, painter, and architect (Uffizi Palace, Florence) biographer and "father of modern art, history and criticism." (*Lives of the Most Eminent Painters, Sculptors, and Architects*) a classic despite inaccuracies.

Vasco da Gama (c. 1469-1524), Portuguese navigator, 7-382, 7-389; and route to India, 1-23; and Natal, 5-325, 7-89.

Vascular tissue. In botany, fibres that convey sap throughout a plant, 7-313.

Vashti, Queen of Ahasuerus, king of Persia, put aside for disobedience (Book of Esther).

Vatican, City and State. The Papal see at Rome; 7-382, 383 illus. 6-62, 6-427, 4-316.

Vatican Council, Church council of 1870, which proclaimed the Pope's infallibility in questions of faith and morals when speaking *ex cathedra*.

Vatnet or Vatnet [vat'et], 2nd largest lake in Sweden; area 733 sq. m.

Vauban [voh'bān] Sébastien le Prestre de (1633-1707), Marshal of France, most celebrated of military engineers.

Vaucanson, Jacques de (1701-82), Fr. inventor of automatic pattern weaving, 4-335.

Vaudeville, Originally a light, amusing play with dialogue interspersed with songs; now music-hall show; in Fr., 6-60.

Vaughan, Henry (1822-95), Welsh metaphysical poet, known as "The Silurist"; devotional poems, *Silvæ*, *Seraphims*, later influenced Wordsworth.

Vaughan Williams, Ralph (b. 1872) Brit. composer; works influenced by folk-music, and entirely individual, include: "London Symphony"; *Rhaps. the Drifter* (opera); *Mosses in G minor*, *Job* (ballet); O.M. (1935); 5-306, 5-288.

Vauquelin, Louis Nicolas (1763-1829), Fr. chemist; and chromium, 2-382.

Vauxhall [voks'haw], Gardens. Former place of re-out and entertainment in S.W. London on Surrey side of Thames, built 1691, closed 1839 and built over; circus acts at, 2-101.

Veal, meat of calf; best cattle for, 5-151.

Vecellio, Tiziano. See Titian.

Vecht [vekht], River. Arm of the Rhine, 18 m. long.

Vedas [vā'das], Sacred writing of Hindus, 4-178.

Vedda, Ancient primitive people of Ceylon, 2-297.

Vega, Star of the first magnitude, 7-147.

Vega Carpio [vāgah kahr'pēō], Lope Félix de (1562-1635), generally called Lope de Vega. Sp. dramatist and poet, 7-123, 3-119.

Vegetable ivory, sources, 4-332, 5-487.

Vegetable Jelly, 3-511.

Vegetable Marrow, 2-24.

Vegetables, blanching, 6-217; canning, 2-212; cookery, 2-498; food value,

3-480; and market gardening, 5-130.

Vegetable Tanning, method of tanning leather, 4-466.

Vegetable Waxes, derived from plants, 7-432.

Vegetarianism. Abstention from animal food, 7-393.

Vehicles. See Motor Vehicles; Road Transport.

Veil, It. Anc. Etruscan stronghold.

Veile [vī'le], Picturisque tn. of Denmark; pop. 23,000.

Veins, in circulatory system, 4-111; in early medical theory, 1-492; lack of pulse in, 6-304; in plant leaves, 4-470.

Velazquez, [vā'lah'keth], Diego (1605-63), Sp. soldier; accompanied Columbus to W. Indies on 2nd voyage; founded Havana; and Cortés, 2-513.

Velazquez, Diego Rodriguez de Silva y (1599-1660), Span. painter, 7-383, 384, 385 illus. 7-121, 6-31; The Maids of Honour, 7-117 illus.; The Surrender of Breda, 5-115 illus.

Veld [volt] or **Velde**. Plains in S. Africa, 7-58.

Velde, Adriaen van de (1636-72), Dutch marine painter, 5-384.

Velde, Jan van de, Dutch marine painter, 5-391 illus.

Velde, Willem van de (1633-1707), Dutch marine painter, 5-384.

Veleta. Variation of the waltz, 3-37.

Vellinghausen, Battle of (1761), in Seven Years' War, 7-2.

Vellum. Fine parchment, 2-2.

Velvet. A silken fabric with short, thick pile; introduced, possibly from the Far East, into Europe before the end of the 13th or at the beginning of the 14th century; 2-119.

Velvet of deer antlers, 4-191.

Velveten. A cotton cloth with a soft face, the web being afterwards cut to provide a pile resembling that of velvet.

Vendée [vahn'dā], Maritime dept. of W. Fr.; area 2,600 sq. m.; pop. 393,800; centre of royalist revolt (1792-93) against Fr. republic, 3-169.

Vendôme [vahn'dōm'], Fr. tn.; pop. 10,400; ruins of 11th cent. castle of Counts of Vendôme.

Veneer. Thin sheet of a valuable timber glued over a cheap wood to give it a rich surface. Used in furniture and cabinet making.

Venetia [venē'shā]. Dist. in N. It. between Alps and Adriatic; anc. Rom. prov.; long ruled by Venice, ceded to Austria (1797); 4-304.

Venetian Embroidery, 3-239.

Venetian Lagoon. The site of Venice (built on wooden piles), 7-387.

Venetian Point. Lake, 4-130 illus.

Venezia [vā'nā'ziā]. It. for Venice.

Venezuela. A republic of S. Amer.; area 352,143 sq. m.; pop. 4,985,716; cap. Caracas; 7-384; map, 7-385; flag, 3-383 illus. f.

Venezuela, Gulf of, or Gulf of Maracaibo. Inlet of Caribbean Sea in N.W. Venezuela.

Venice. City of It., at head of the Adriatic; pop. 323,618; 7-387, 388 illus.; early bank, 1-363; Bridge of Sighs, 7-387, 389 illus. f.; Doge's palace, 7-387; the Fourth Crusade, 7-388; and Genoa, 3-513; gondolas, 4-313 illus.; Grand Canal, 7-387, 388 illus.; Gk. wars with Turks, 4-78; League of Cambrai, 7-388; the Lido, 7-387; Rialto Bridge, 7-387; St. Mark's cath., 7-387; Wedding of the Sea, 7-387, 1-21; Venetian galleys, 7-28; Venetian school of painting, 4-318, 319.

Venzelas [vā'nē'zā'las], Eleutherios (1864-1936), Gk. statesman; several times prime minister and during 1st World War virtual dictator; in 1935 engineered an unsuccessful revolt from his birthplace, the Isle of Crete; 4-78.

Vennacher [ven'akahr] Loch. Lake of Perthshire Scot.; about 4 m. long and 11 m. broad, 6-138, 6-511, 513 illus.

Ventricle. Lower chambers of the heart, 4-144.

VERMORK

Ventriloquism (Lat. *venter* stomach, *loqui*, to speak). Art of making the sound of the human voice appear to come from a distance, e.g. from some person or object other than the speaker. Ventriloquists speak without moving their lips, but the art lies chiefly in subtle suggestion by the performer of the direction from which he wishes his voice to appear to come, by the use of a dummy figure with moving lips; and by accurate mimicry of the sound as it would be heard from the supposed source.

Ventpils, formerly Windau. Spt. of Latvia S.S.R.; pop. 16,000; 4-453.

Venturi, Giovanni Battista (1740-1822), It. physicist and philosopher; invented Venturimeter, 5-184.

Venus. Roman goddess, became identified later with Aphrodite, the Greek goddess of love, 7-388, 389 illus.; and Psycho, 3-11; and the Trojan War, 7-320.

Venus. A planet, 7-389; atmosphere of, 1-82; compared with earth, 6-212; phases discovered by Omali, 1-281; in solar system, 1-262, 270 illus.

Venus de Milo. Gk. sculpture in The Louvre, Paris, 4-90, 7-389, 4-61 illus., 5-47 illus.

Venus's Fly-Trap. An insectivorous plant, 7-389.

Vera Cruz. Principal port of Mexico, pop. 123,463, 7-390, 5-186.

Verb, in grammar, 7-390, 4-55.

Veroingetorix [veroi'ngetoriks] (d. 46 B.C.). Chief of the Arverni, tribe of Gaul, leader of the great rebellion against Caesar, beheaded by Caesar's officer; 2-161.

Verde, Cape. Westernmost point of Africa, 1-49.

Verdi, Giuseppe (1813-1901). It. composer of opera, 7-391, 5-305, 5-316, 319, 320.

Verdigris. Poisonous green pigment known to the anc. Romans and produced largely in the wine district of France. It is a basic copper acetate made by the action of acetic acid on copper plates; it is used in paints, in dyeing, and also in printing. It is the cause of the green discoloration formed on copper exposed to moist air.

Verdun. Tn. in dept. of Meuse, Fr. pop. 11,600, in 1st World War 7-479, in 2nd World War, 7-155, 490.

Verdun. Residential suburb of Montreal, Canada; pop. 77,391, 2-130.

Verdun, Parution of (843), 4-5, 4-185, 3-149, 3-313, 3-357.

Vereeniging, Treaty of (1902), concluded Boer War, 1-503, 7-308.

Verga, Giovanni (1810-1922). Italian novelist, 4-340.

Verge. See Weights and Measures.

Verge escapement, in clocks, 2-413.

Vernaeren [verna'ren], Emile (1880-1916). Belgian poet and critic, poems marked by patriotic fervour and by attempt to individualize towns and fields of Belgium (*Les Flamandes*, *Villages Illusoires*).

Verkhoyansk, Siberia. Coldest inhabited place in world, record temp. below zero (1885), 1-164, 1-264.

Verlaine, Paul (1844-96). Fr. lyric poet, the exquisite cadence of whose verses expresses his delight in the fine shades of sensation (*Poésies*, *Œuvres complètes*, a collection religious poems; *Amour*; *Œuvres complètes*).

Vermeer, Jan (1632-75). Dutch painter, 7-391, 392 illus., 5-384; Girl Reading at a Window, 5-385 illus., a portrait 6-35 illus.

Vermiculite [vermichu'el'it]. A form of mica, 5-53.

Vermiculite. Variety of mineral; commercial uses, 5-214.

Vermilion. Red sulphide of mercury, poisonous red pigment used in sealing wax and paints, 5-174.

Vermont. A New England state of U.S.A.; area, 8,609 sq. m.; pop. 378,000; cap. Montpelier; 7-392.

Vermork, Norway; heavy-water usage in 2nd World War, 1-303.

VERNAL EQUINOX

Vernal Equinox, 2-294; and spring, 6-255.
Verne, Jules (1828-1905). Fr. novelist, 7-392, 2-356, 5-317; *Twenty Thousand Leagues Under the Sea*, story, 7-393.
Verneuil, Battle of (1424), in Hundred Years' War, 4-204.
Vernier. A small movable auxiliary scale which is attached to and slides in contact with a fixed scale marked in larger graduations or units. It enables readings on the larger scale to be reduced to smaller fractions (usually 1/10) of the larger graduation. Invented by the French mathematician Pierre Vernier (1580-1637).
Vernon, Dorothy (16th cent.). Daughter and heiress of Sir George Vernon; eloped with Sir John Manners and became ancestress of dukes of Rutland; heroine of Charles Major's novel, *Dorothy Vernon of Haddon Hall*.
Vernon, Edward (1684-1757). Eng. admiral; captured (1739) Porto Bello, Panama, with a fleet of 6 ships; Mt. Vernon named after him; and "grog," 5-433.
Verona (văr'ônah). It. fortified city 62 m. w. of Venice on r. Adige; pop. 153,700; art centre in Middle Ages; famous art collections and Rom. remains.
Veronese (vărônâ'sâ', Paolo (1528-88). Last great painter of Venetian school; real name Paolo Cagliari; 4-319, 4-325 illus.
Veronica, St. Legendary woman of Jerusalem, on whose kerchief used by Jesus to wipe the bloody sweat from His brow on way to Calvary. His portrait was said to have been miraculously imprinted.
Verrazano (verrà'sân'ô), Giovanni (c. 1480 c. 1527). It. explorer of New World in Fr. service, 1-136, 5-121.
Verrocchio (verô'kîô), Andrea del (1435-88). It. sculptor, goldsmith, and painter, great early Renaissance artist; 4-320, 328 illus.; teacher of Perugino and Leonardo da Vinci, 4-318, 4-184.
Versailles. Tn. of Fr. 10 m. s. of Paris, 7-394; palace, 5-12.
Versailles, Treaty of (1763), ended War of American Independence, 7-391.
Versailles, Treaty of (1819), 7-394, 7-183, 184; and Kaiser Wilhelm II, 7-454, and Poland, 7-403; post-war Germany, 4-9; signature of, 3-317 illus.
Vers libre, in poetry, 6-235.
Vert des Alpes. Variety of marble, 5-121 illus. f.
Vertebrae, the component bones of the spinal column, 7-60, 1-114 diag.
Vertebrates. Animals with backbones, 7-394, 1-155, 7-60, 3-322; fossils, 1-156.
Verulamium, anc. Rom. city nr. St. Albans, 6-186; destroyed by Bon-dicea, 1-496; reconstruction, 6-136.
Verviers (văr'vîr'), Belgium, twn.; pop. 40,300, woollen goods, dyes, glass.
Vesalius, Andreas (1511-64). Belgian anatomist, 1-143, 5-162, 7-526, 7-194.
Vespa. A genus of wasps, including the common British species, 7-423, 424.
Vespa'sian (Titus Flavius Sabinus Vespasianus) (A.D. 9-79). Rom. emperor, father of Titus and Domitian; in his reign Titus captured and destroyed Jerusalem, the Colosseum was begun, and Agricola extended Rom. sway in Britain, 6-139.
Vespers, canonical hour of prayer in R.C. Church, 5-244.
Vespers, Sicilian. See Sicilian Vespers.
Vespucci (vê'spû'chî), Amerigo (1451-1512). It. merchant and navigator; America named after, 1-132.
Vesta. In Rom. myth., goddess of the hearth, identified with Gk. goddess Hestia. Her worship shows importance of fire in primitive communities. The Atrium Vestae at Rome held a sacred fire, supposed to have been brought from Troy by Aeneas, and maintained by the Vestal Virgins.
Vesuvius, Mt. Active volcano, 10 m. from Naples, Italy, 7-395, 7-403,

4-309 illus.; lava, 4-456 illus.; lava used for paving stones, 5-317; destruction of Pompeii, 6-256.
Vetches. Various bean-like plants, grown mainly for fodder.
Veterinary Surgery, as career, 2-241.
Ve'to. A power possessed by a ruler or superior legislative body to reject or postpone proposed legislation.
Vevey (vêv'î), Switzerland. Tn. on Lake Geneva; tourist resort; pop. 12,600.
Vézelay (vâz'êl). Fr. vill. in dept. of Yonne noted for the Madeleine (12th cent.); one of the largest and finest basilicas in France.
Vézère (vâz'êr'). R. of s. Fr.; flows 129 m. to the Dordogne.
Vian (vîan), Sir Philip (b. 1891). British naval officer; as capt. of the destroyer *Cossack* rescued Brit. sailors from Ger. prison ship *Altmark*; covered landings in Sicily and Salerno 1913; commanded 1st aircraft carrier squadron in Pacific 1941-45 and became 2nd in command of Brit. Pacific fleet; 5th Sea Lord in 1946; in 1948 Adm. of Fleet; c-in c. Home Fleet 1949-52.
Viborg. See Viipuri.
Vibration, of electromagnetic waves, 6-340; and sound, 4-56, 7-101, 7-86, 87. See also Ultrasonics.
Vicar, in Church of England, 2-386.
Vice-Admiral, in Royal Navy, 1-20; insignia, 5-354 illus.
Vicenza (vîçen'tsâ), It. Tn. on r. Bacchiglione 40 m. w. of Venice; pop. 72,310; produces silk goods.
Viceroy, of India, appointed after India Act of 1858, 4-253.
Vichy (vî'chî), Tn. in cent. Fr. on Allier r., famous mineral springs. Seat of Pétain's govt. after French capitulation (1940), 6-114, 7-189.
Vickers-Maxim gun, 6-61.
Vickers Vimy Twin engine bomber, 1-33 illus.
Vickers Viscount. Turbo-prop airliner, 1-14 illus.
Vicksburg, Mississippi U.S.A. Mfg. and cotton trading city on Mississippi; pop. 27,950; decisive battle in Amer. Civil War, 5-227.
Victor Emmanuel II (1819-78). First king of united Italy (1861-78), made Cayour his premier, 1852, 4-416.
Victor Emmanuel III (1869-1944). King of Italy 1900-46; and Mussolini, 5-311.
Victoria (1819-1901). Queen of Gr. Brit. and Ireland, 1837-1901, 7-395, 396 illus. f.; and Albert, 1-92, 93 illus.; and Bahmorad, 1-356; and Buckingham Palace, 2-104; her diary, 3-86; dolls, 3-104; assumed title of Empress of India, 4-253; family name, 6-163; and the Great Exhibition, 3-327; and Leopold I of the Belgians, 4-184; and Palmerston, 6-52; stamps, 7-113, 114 illus.
Victoria. A state of the Australian Commonwealth; area 87,884 sq. m.; pop. 2,291,354; cap. Melbourne; 7-396, 1-318.
Victoria. Cap. of prov. of Brit. Columbia, Canada, on Vancouver Isl.; pop. 87,400; 7-397, 2-80.
Victoria. Cap. city of colony of Hong Kong; pop. est. 707,000; 4-191.
Victoria, Lake or Victoria Nyanza. In E. cent. Africa, 2nd largest freshwater lake in world; area about 27,000 sq. m.; 7-397, 5-440, 1-49.
Victoria, Mt., Canada, in s.w. Brit. Columbia, overlooking Lake Louise; height 11,500 ft.
Victoria and Albert Museum, S. Kensington, London; contains the finest collection of applied art—decorative and ornamental—in the world, founded as the Museum of Manufacturers in 1852; sometimes known as the South Kensington Museum, 5-300, 5-26 illus.
Victoria Cross (V.C.). Brit. decoration for gallantry, 5-329.
Victoria Embankment, London, 5-21.
Victoria Eugénie (Ena), Queen of Alfonso XIII of Spain, 1-102.
Victoria Falls, Cataract on Zambezi r. S. Rhodesia; height varies from 236 to 357 ft., and falls are over a

VILLARS

mile wide; 7-397, 1-64 illus.; covered by Livingston, 4-327.
Victoria Island, Canada. Large isl. in Arctic Ocean; in Mackenzie dist., North-West Territories; copper deposits, 1-220.
Victorian Age; architecture, 1-217; the novel, 5-172.
Victoria Nyanza. See Victoria, Lake.
Victoria Regia. Gigantic water lily of the Amazon, 7-428, 4-102.
Victoria River. Flows in the w. of Northern Territory, Australia, and flows N. and W., entering the Indian Ocean by a wide estuary called Queen's Channel.
Victoria Station. Main line London rly. terminus (S. Region), near Buckingham Palace Rd., opened in 1860.
Victor's Laurel. Alternative name for sweet bay, 4-156 illus.
Victory, H.M.S. Brit. ship of the line; Nelson's flagship at Trafalgar, 5-363, 7-305; death of Nelson, 5-366 illus.
Vicuña. S. Amer. animal of the camel family, 1-119, 4-530; fur, 6-139.
Vienna. Cap. of Austria; pop. 1,760,164 7-397, 398, 399 illus.; 1-121, 325, besieged by Turks, 7-335, taken by Russians in 1915, 7-496.
Vienna, Congress of (1814-15), 7-399 3-316 illus., Germany and, 4-8.
Vienna bread, 2-52.
Vienne (vîen'), Fr. Anc. tn. on r. Rhône; pop. 22,000; varied mfg.; large trade; fortified by Caesar 17 B.C.; Roman aqueducts, many antiquities, 6-396.
Vientiane. Cap. of Laos, Indo-China; pop. 10,000 4-116.
Vietminh. Communist rebel organization in Indo-China, 7-400, 4-257.
Vietnam. State of Indo-China recognized in 1949 and comprising the former Fr. protectorates of Annam, Tongking, and Cochinchina, 7-398, 4-246 map, 4-257; children, 2-339 illus.
Vigée-Lebrun, Marie Elizabeth Louize (1755-1812). Fr. painter, encouraged by Greuze and Vernet; sentimental portraitist; Marie Antoinette, 5-126 illus.
Vigeland, Gustav (1869-1943). Norwegian sculptor, 5-167, 6-7.
Vigil. Ecclesiastical term for day of fasting and night of prayer before certain feasts; in ceremony of Night-bloom, 4-116 illus. f.
Vignemale. Mt. in Pyrenees, 10,794 ft., 6-313.
Vigny (vî'nyé), Alfred de (1797-1863). Fr. poet and dramatist; though he wrote relatively little, his fame is secure; some of his most famous poems ("Eloa," "Dolorida"; "Morte") greatly influenced Hugo and the Romantics, 3-156.
Viipuri (Swed. Viborg). Town of Karelo-Finnish S.S.R., on Gulf of Finland, 75 m. s.w. of Leningrad; founded by Swedes in 1293, cap. of Katcha, taken by Peter the Great in 1709; Finnish after 1st World War, it became Russian in 1910.
Vikings. Ancestors of modern Scandinavians; originally known as Norsemen, or Northerners, 7-400; in Greenland, 1-220; migrations, 5-204, and Normandy, 5-148; in Orkney Isls., 6-3; and ravens, 6-307; ships, 7-28, 5-353, 3-412.
Vilayet (vîlayet'). Former name for the Il a Turkish governmental unit, governed by a vali; its sub-divisions are called ilçe.
Villa (vî'lyâ), Francisco or "Pancho" (1872-1923). Mex. revolutionist and bandit; made peace 1902 with Mex. govt.
Village Blacksmith, The. Poem by Longfellow, 5-34.
Villa Rica (vîl'yâ rê'kâ), City of Paragway in agric. region; pop. 31,000; large trade in tobacco and Paragway tea; 6-76.
Villars (vîl'hîr'), Claude Louis Hector, Duc de (1653-1731). Marshal of France, one of greatest Fr. generals; commanded against Eugene and Marlborough in War of the Spanish Succession.

VILLENEUVE

Villeneuve, Pierre Charles Jean Baptiste Villeneuve de (1763-1808). Fr. naval officer; commanded Franco-Spanish force at Trafalgar; defeated and taken prisoner; released 1808, but committed suicide 7-304.

Villiers, Duke of Buckingham. See Buckingham.

Villon (v'yon), **Francis** (1431-1). French poet; *Le Petit Testament* and *Le Grand Testament*; 7-400, 3-455.

Vilna (Lithuania). See Vilnius.

Vilnius. Cap. of Lithuania S.S.R.; pop. 209,400; 4-534.

Vincennes, Battle of (1808). Wellington's victory at during Peninsular War, 6-110, 7-437.

Vimy (v'më) Ridge. A high ridge 4 m. N.E. of Arras, Fr.; Canadian war memorial to Canadian troops who stormed the height in the third battle of Arras, in 1917; unveiled by King Edward VIII in 1936.

Vina del Mar. Residential suburb of Valparaiso, Chile; pop. 70,000; 2-359 illus.

Vincennes (vansën'), France. Military tn. adjoining Paris on S.E.; pop. 49,200; celebrated castle begun 1164, now a fort, arsenal and barracks.

Vincennes, Indiana, U.S.A.; first Fr. settlement in Indiana, 4-255.

Vincent de Paul (van'sahn der pöl), St. (1576-1660). Fr. priest, founder of the Sisters of Charity of St. Vincent de Paul and other orders devoted to "social service."

Vinci, Leonardo da. See Leonardo da Vinci.

Vindhya. Range in cent. India; highest point, 5,000 ft.

Vindhya Union (Pradesh). State of Rop. of India; area 24,600 sq. m.; pop. 3,577,431; cap. Kora; 4-241.

Vine. Shrub, *vitis vinifera*, bearing the grape; cultivation, 4-02; pepper vine, 6-121 illus. f.

Vinegar. 7-401, 5-97.

Vineyards. In Franco, 3-436, 433 illus.

Vinland. Norse name for N. Amer., 1-132.

Vintners' Company. 4-526.

Viol. Musical instrument; modern derivatives of, 5-309.

Viola. Stringed musical instrument. 7-402, 6-307.

Viola. Genus of plants including violet and pansy, 6-50.

Violet. Plant, 7-401; leaves, 4-471 illus.

Violet Clavaria. A fungus, 3-488 illus. f.

Violet Snail. 5-232 illus. f.

Violin. Stringed musical instrument, 7-401, 6-307; as leader of orchestra 5-528.

Violet-le-Duc (v'ölë' le dük'), **Eugène Emmanuel** (1814-79). Fr. architect, archaeologist, critic, scientist, chief prophet of the Gothic revival in architecture, who revealed to the modern world the logic and beauty of the despised "barbarous" medieval construction. He wrote a history of domestic architecture.

Violoncello. See Cello.

Vipers. Most dangerous of all poisonous snakes, 7-402, 7-75.

Virechow (fër'khö), **Rudolph** (1891-1902). Ger. pathologist, anthropologist and archaeologist; estab. doctrine that disease is caused by disturbance of the body-cells; 7-195.

Virgil (Publius Vergilius Maro, 70-19 B.C.). Rom. poet, 7-402, 4-450 with illus.; in the *Divine Comedy*, 63-46; story of the Wooden Horse at Troy, 7-320.

Virginal. See Spinet.

Virginia. In Rom. legend, daughter of centurion Virginius, who killed her to prevent her falling into hands of Appius Claudius the decemvir (493 B.C.).

Virginia. State of U.S.A., on eastern seaboard; area 49,620 sq. m.; pop. 3,318,680; 7-403; origin of name, 6-363; colony founded 1607 1-133.

Virginia Creeper. A creeping or climbing plant of the family *Vitaceae*.

Virginia Deer. A white-tailed species of deer. 3-80.

Virginia Juniper or Red Cedar; species of juniper much used in N. America for cabinet making, etc.

Virgin Islands. in the Leeward Islands group, W. Indies, 50 m. E. of Puerto Rico; owned by Gt. Brit. and U.S.A.; over 100 is.; exceptionally mountainous; inhabitants chiefly Negroes; area 300 sq. m.; pop. 32,500.

Virginius. See Fraseium.

Virgo (the Virgin). One of the 12 signs of the Zodiac, 7-524 illus.

Virus. Living organism causing disease in plants and animals, and so minute as to pass all filters; invisible under microscope, but have been photographed by ultramicroscope and electron microscope, 4-14, 15.

Vishy. See Wisby.

Viscconti. Name of a noble It. family who ruled Milan (1277-1447), 5-205.

Viscose process. in rayon mfr., 6-369.

Viscose Rayon. mfr., 6-369.

Viscount (vi'kwänt). British title of nobility, ranking between earl and baron, 6-106.

Viseu. Tn. in Portugal; pop. 75,468; 6-267.

Vishnu. Hindu god, the Preserver, 4-173.

Visigoths. And. Germanic people, 4-49, 3-313; in Spain, 7-103.

Vision. effect of atmosphere, 1-81; carotene and night-vision, 2-322. See also Eye; Optics.

Viso, Monte. Mt. in N. Italy, 12,608 ft. source of R. Po near, 6-231.

Vistula. R. of cent. Europe, flowing more than 600 m. to Baltic Sea. Important commercial highway of Poland; 7-403, 4-1.

Visual Purple. in retina of eye, 2-465, and night vision, 2-322, 334.

Vitaceae (vitäëë). The grape family of plants.

Vitamin A. and night-blindness, 3-334.

Vitamins. Organic substances necessary to normal health, 7-403, 3-410, 409 diag.; and biochemistry, 1-446; in margarine, 6-124; in milk, 5-205; ultra-violet rays in formation of vitamin D, 7-344; vitamin A1 and colour vision, 2-465, yeast as source of vitamin B, 7-512.

Vita Nuova ("New Life") "Prose" work by Dante, 3-46.

Vitascope. "Forerunner of modern cinema projectors; 2-392.

Vitebsk (vë'tebësk). Town in White Russia, on Dvina; pop. 167,400; rly. centre; in flax-raising dist.

Viterbo (vë'tërbö), It. Historic walled tn. 88 m. N.W. of Rome; pop. 36,000; Gothic cathedral and churches with tombs of several popes; celebrated sulphur springs; Etruscan antiquities near by.

Viti Levu (vë'të lä'vö). Largest of Fiji is.; area 4,033 sq. m.; 3-361.

Vitoria (vë'tör'ia). Sp. city in N. centre 33 m. S.E. of Bilbao; pop. 52,206; varied mfrs.; decisive victory of Wellington (1813), freeing Sp. from Fr. dominion, 6-117.

Vitreous body. of eye, 3-331.

Vitreous enamel. 6-38.

Vitriol. General term for a number of corrosive metal sulphates or salts of sulphuric acid (q.v.).

Vivace. See Musical Terms (list).

Viviparous insects. 4-293.

Vlaardingen (v'laärdingen). Netherlands. Old tn. and river port on Maas, 6 m. W. of Rotterdam; pop. 50,470; centre of herring and cod fisheries.

Vlachs (vlakhs). A Latin race widely scattered through S.E. Europe, N. and S. of the Danube from R. Bug, to Adriatic; in Rumania, 6-470.

Vladimir (vläd'mëri). St. (d. 1015), "the Great," grand duke of Kiev, first Christian sovereign of Rus.; married a Byzantine princess and introduced Gk. Orthodox Church.

Vladivostok. City and apt. of Far Eastern Region, Siberia, 7-43, harbour kept open in winter by ice-breakers. Terminus of Trans-Siberian rly. Shipbuilding chief industry; trade and market centre. Has univer. Pop. (1930) 200,000.

VOLTA METER

Viaminak, Maurice de (b. 1876). Belg. artist, 1-422.

Viene (Albania). See Valona.

Vitava. R. of Czechoslovakia; rises near Austrian frontier in Bohemian Forest and flows generally N. through Prague, joining Elbe at Mělník; Prague on, 6-219.

Vocal Cords. Fibrous bands in the throat, suspended in the larynx, 7-404.

Vocal organs. of birds, 1-457.

Vod'ka. Russ. intoxicating drink, made from potatoes, corn, and rye malt.

Vogelweide. Walther von der (c. 1168-1228). Ger. poet, 4-13.

Voices. 7-404.

Voices. in grammar, 7-390.

Volapük. Artificial international language; 3-296, 4-445.

Volatile Oils. See Essential Oils.

Volcanic islands. in Pacific Ocean, 6-98.

Volcano. 7-404, 405 illus. f., 4-456; formation, 5-138 illus.; and earth's shrinkage, 3-151; Vesuvius, 7-395. See also names of individual volcanoes.

Vole. General term for a group of small rodents, including the water vole; word formed from "arvicolle" (Lat. *arvicola*), meaning "field dweller."

Volga. Greatest r. of Europe, over 2,000 m. long, 7-405, 3-408, 6-472, hydro-electric power from, 4-218.

Vol'khov. R. of N.W. Russia; issues from Lake Imen near Novgorod, flows N.E. 130 m. to Lake Ladoga.

Volks. Ger. national epics, 4-13.

Volscians (völ'shünz). Anc. Italic tribe; inhabited dist. S. of Latium 6-430.

Volstead. Andrew J. (1860-1947) American politician, became famous as author of the 18th amendment to the American Constitution, known as the "Volstead Act," prohibiting sale of intoxicating liquors. See Prohibition.

Volsunga. In Norse myth, heroic race descended from Odinn, from which sprang Sigurd, story told in the *Volsunga Saga* and William Morris's *Story of Sigurd the Volsung*.

Volt. Practical unit of electromotive force or pressure (called potential difference). It is that electromotive force which, applied steadily to a conductor the resistance of which is one ohm, produces a current of one ampere.

Volta, Alessandro (1745-1827). It. physicist; invented voltaic cell 1-386, 3-210. Volt, the unit of electrical pressure, was named after him.

Volta. R. of W. Africa; rises in E. Sudan in two headstreams and flows to the Bight of Benin; total length about 900 m.

Volta Effect. The potential difference induced when two dissimilar and insulated metals are placed in contact with one another in air, so that one acquires a positive potential with respect to the other.

Voltage. In electricity, 3-210; in batteries, 1-387; of grid and transformers, 3-218.

Voltaic Cell. Source of electrical energy depending on chemical action and complete in itself, as in cells or storage batteries; 1-386 diag.

Voltaic Pile. Device for "producing electric current chemically, 3-210"

Voltaire (1694-1778). Pen name of François Marie Arouet, Fr. philosopher and satirist, 7-406; and Frederick the Gt., 3-431; 3-15 6-160.

Voltameter. Instrument for measuring electric current. Consists of an electrolytic cell in which a metal generally silver or copper, is deposited by electrolysis (q.v.) of a salt of one of these metals upon the cathode. From the increase in weight of the cathode and a knowledge of the electrochemical equivalent of the metal used the quantity of electricity that has passed through the cell can be measured.

VOLT-AMPERE

Volt-Ampere. Unit of apparent electric power. It is defined as the product of voltage and current.

Volta Redonda. Brazilian steel tn., 70 m. from Rio, 4-393.

Voltmeter. Instrument for measuring the value of an electrical pressure between two points. Made like an ammeter (q.v.); 3-46.

Volturno, R. in s. Italy, rises on w. slope of Apennines; flows s.w. 100 m. to Tyrrhenian Sea.

Voluntary Aid Detachments (V.A.D.). Brit. civilian bodies (of both sexes), organized by Red Cross and St. John Ambulance Assoc., etc., to help in emergencies.

Voluntary muscles, in physiology 5-295.

Volute, in architecture, 5-532.

Voodoo, form of black magic, 5-78.

Voortrekkers. Boer farmers who in 1836 migrated from the Cape to the Transvaal, S. Africa, 1-502.

Vorarlberg [förschibärkh], Austria, province in w. corner, adjoining Germany and Switzerland; area 1,003 sq. m.; pop. 183,200; Alpine region; pastoral region; makes cotton fabrics.

Vor'omov, Serge (1868-1951). Russ. surgeon who experimented with a glandular treatment designed to overcome or postpone old age (popularly called "monkey glands").

Voroshilovsk (formerly Stavropol). Trading and farming town in s. Russia, 250 m. s.w. of Stalingrad; pop. 85,000.

Vosges Mts. Range in e. France opposite the Black Forest in Ger., 7-406, 8-434.

Vote or Suffrage, 7-407; ballot, 1-350; in Brit., 3-70, 3-209; female suffrage and the "suffragettes," 6-88, 7-330 illus.; transferable vote, 3-209.

Voussoir, in architecture, 1-201.

Vowel. A sound constituting a syllable or capable of being sounded alone; an open and unimpeded sound as opposed to a closed, stopped, or mute consonant; simple vowels, *a, e, i, o, u*; in singing, 7-57.

Voysey, Charles François Annesley (1857-1941). Brit. architect, 1-218.

Vries, Hugo de (1848-1935). Dutch botanist; evolution theory, 3-324.

Vulcan, in Rom. myth., god of fire and metal-work; identified with

WALKER CUP

Gk. Hephaestus, 7-380, 7-406; and the Cyclops, 3-17. See also Hephaestus.

Vulcanised rubber, process, 6-465.

Vulcanism, in physiography, 6-186.

Vulcanite, or Ebonite. Rubber hardened by vulcanisation, 6-163.

Vulgate Bible. Translation of the Bible into Latin by St. Jerome, used in R.C. churches, 1-442.

Vulture. A bird of prey, 7-407, 1-266 illus.; condor, 2-479 illus.

Vylenborch, Saskia von (d. 1612). First wife of Rembrandt, 6-383.

Vyrnwy, R. of Montgomeryshire, Wales, tributary of the Severn, 7-4.

Vyrnwy, Lake. Artificial lake in Montgomeryshire, Wales; really the upper valley of r. Vyrnwy which has been dammed and made into a lake holding more than 12,000 million gallons; supplies Liverpool with water, 6-253.

Vyslinsky, Andrei (1883-1951). Russ. lawyer and politician; prof. of jurisprudence at Moscow, 1925-27; deputy public prosecutor, 1933-39; at U.N. conferences, 1945-49; foreign min. 1949-53; Soviet rep. to U.N. 1953-54.



THE twenty-third letter of the English alphabet is formed of two V's, but we call it "double u." The stories of U and V explain why this is so. The letter was originally written U or VV in the days when U and V were forms of the same letter. But in this case the VV form, which became W when the letters were crossed, was the one that survived. In sound it remains an ambiguity, half vowel and half consonant. It is

usually pronounced as in *we*, with the lips rounded as for the *oo* in *pool*, but without the resonance and fullness of a genuine vowel. In *which, when, or what*, the spelling reverses the pronunciation, which is *hw*, a curious whisper peculiar to English to-day, though also occurring in the dead Gothic language. In *whole* the W is silent, and the W once sounded in *write* and *wrong* has disappeared. W is pronounced as *v* in German, the V being sounded as *f*.

Waal [vahl], r. in Netherlands, the southern arm of Rhine, 5-185.

Waals, Johannes Diderik van der (1837-1922). Dutch physicist; invented an equation to describe the relations between pressure, volume, and temperature in a gas, which would take account of the size of the gas molecules themselves and the forces of attraction (van der Waals's forces) between them; 3-510.

Wabash, r., tributary of Ohio r., U.S.A., rising in w. Ohio and forming part of boundary between Illinois and Indiana; 550 m. long; 4-236.

Wade, George (1873-1948). Eng. soldier; after the Jacobite rebellion (1715) held command in the Highlands, and built a series of fine military roads, 6-405, 6-512.

Waders. A group of birds, 7-408.

Wadham College, Oxford Univ., 6-18.

Wadi. Term for a dried-up river bed in N. and E. Africa, 6-484.

Wadi Halfa. Tn. on frontier of Egypt and Sudan; 3-173.

Wafd. Nationalist party in Egypt, first became prominent by winning elections of 1926, dissolved by General Neguib in 1953; demands for independence, 3-178.

Wagner, Cosima (1841-1930). Daughter of Liszt and 2nd wife of Richard Wagner, directing spirit of Bayreuth Theatre after Wagner's death.

Wagner, (Wilhelm) Richard (1813-83). Ger. composer, 7-408; influence on music, 5-305; and orchestra, 5-517; on Beethoven's development, 1-412; championed by Shaw, 7-19; operas, 5-515, 517, 518, 519, 520, 5-429.

Wagram [vagrām], Austria, vil. 12 m. n.e. of Vienna; battle (1809), 5-322.

Wagtail. A bird, 7-409.

Walling Wall, Jerusalem, 4-361.

Wairangi, Treaty of (1840). Signed by leading Maori chiefs and Capt. William Hobson of Royal Navy

whereby Maoris recognized Brit. rule in New Zealand, 6-425.

Waiwai. Natives of the Amazon basin; 1-130 illus.

Wake. Isl. of Pacific Ocean, one of group of three; 3,000 m. E. of Hong Kong and 2,000 m. W. of Hawaii; area 1 sq. m.; in U.S. possession since 1898, but uninhabited until 1935 Pan-American Airways made it a flight stage; taken by Japs. in Dec., 1941; Jap. base until end of 2nd World War in 1945.

Wakefield. City and co. town of West Riding of Yorks, Eng.; industrial centre; cathedral; pop. 80,380; industries incl. coal-mining, textiles, engineering, chemicals. Battle of (1460), 6-434.

Wakefield Tower. Part of Tower of London, 7-301, 302 illus.

Walker, The. Name given to dyke, nearest the sea in the Netherlands; 5-372.

Wake-Robin. A plant, also known as arum, cuckoo-pint, lords and ladies, and starchwort, 7-409, 410 illus.

Wakes. In industrial dists. of N. England, holiday period for whole town or district, 4-187.

Walbury Hill. Highest point in Berks, Eng. (959 ft.), 1-432.

Waleheren. Notl islands by; dykes breached by Allied air bombing, 5-380.

Wales. Principally in west of Gt. Brit., area 7,466 sq. m.; pop. 2,596,986 (incl. Monmouthshire); cap. Cardiff, 7-410; map, 7-412; physical features, 2-89, 7-410, 412; Snowdonia, 7-77; leek as emblem, 6-512; etymology, 3-207; place names, 7-415; S. Wales coal seams, 2-427; gold, 6-175; University of Wales, 2-220; outline of history, 7-412.

Wales, Church of. The Welsh Church Disestablishment Bill passed 1914, came into operation March 31, 1920; dioceses: Bangor, Llandaff, St. Asaph, St. Davids and Monmouth.

Wales: Language and Literature, 7-414.

Wales, Prince of; Edward I and title, 3-167.

Wales, University of, 2-220.

Walker, John (c. 1781-1859). Brit. chemist; inventor of early type of match (1827), 6-116.

Walker Cup. Trophy competed for by amateur golfers representing Gt.

WELSH COUNTIES AND COUNTY TOWNS

COUNTY	COUNTY TOWN	AREA, Sq. m.	POP.
Anglesey	Beaumaris	275	50,637
Brecon	Brecon	734	56,484
Caernarvon	Caernarvon	569	124,074
Cardigan	Cardigan	692	53,267
Cardiff	Cardiff	920	171,000
Denbigh	Denbigh	693	169,000
Flint	Mold	256	145,108
Glamorgan	Cardiff	813	1,201,989
Merioneth	Dolgellau	660	41,456
Montgomery	Montgomery	797	45,958
Pembroke	Haverfordwest	614	87,208
Radnor	Presteigne	471	19,998

WALKIE-TALKIE

Britain and U.S.A. Founded in 1922, and played for alternately in Gt. Britain and America.

Walkie-talkie. Port. b.c. radio transmitter and receiver; used by police, 6-250 illus.; by first-aid man, 6-350 illus.

Walking. In athletics, 1-290. how one should walk? 3-111. For walking records see *Athletics Records* (list).

Walking dragline. type of excavator, 3-326, 325 illus.

Walking leaf insect. 4-205 illus.

Walking-stick insect; egg, 3-171 diag.

Walküre, Dis. Opera by Wagner, part of the Ring of the Nibelungs; story, 6-320.

Wallaby. Species of kangaroo, 4-392, 6-137.

Wallace, Alfred Russel (1823-1913). Brit. naturalist and explorer, co-discoverer with Darwin of natural selection theory of evolution, 3-52; plants and animals of Asia and Australasia, 1-265. See also *Wallace's Line*.

Wallace, Edgar (1875-1932). Brit. journalist, novelist and playwright. Mostly sensational mystery and detective stories, and plays, which enjoyed great popularity in the 1920s (*The Four Just Men*; *The Ringers*).

Wallace, Lewis (1827-1905). Amer. Civil War general and author (*Ben Hur*; *The Four Gods*); 7-365.

Wallace, Sir William (c. 1270-1305). Scot. national hero and liberator, 7-416, 6-312, 6-348.

Wallace Collection. Collection of pictures, furniture, porcelain, miniatures, enamel, and European and Oriental arms and armour bequeathed to the nation by Lady Wallace. The collection is in Hertford House, Manchester Square, London, 5-27.

Wallace's Line. Imaginary line passing through the Malay archipelago and dividing the Oriental animal region from the Australasian region; first traced by Alfred Russel Wallace, 1-265, 1-156.

Walvolhia [wól'vhiä]. Prov. of w. Romania; area 29,960 sq. m.; pop. 3,500,000; oilfields, 6-169.

Wallaroo. Species of kangaroo, 4-392.

Wallasey. Tn. of Wirral, Cheshire, on Mersey estuary; pop. 101,331; chiefly "dormitory" for Liverpool; includes New Brighton, popular holiday resort; 4-325.

Wall butterfly. 2-140 illus.

Wallenstein [val'nsh-tin]. Albrecht Wenzel Eusebius von, Duke of Friedland (1583-1630). Ger. general, b. Bohemia; commanded imperial army in Thirty Years' War until 1630, recalled to command after Tilly's death, suspected of treason; assassinated; subject of drama by Schiller, 7-270.

Waller, Edmund (1806-87). Eng. poet renowned for lyric verses, of which "Go, lovely Rose" appears in many anthologies; 3-283.

Wallflower (*Theranthus cheiri*). Fragrant cruciferous perennial, best treated as a biennial. Some beautiful varieties are obtainable, with yellow red and variegated flowers; 2-25.

Wall Game. The. Kind of football played at Eton College, 3-304 illus.

Walls, John (1616-1703). English mathematician; discoveries in algebra, 1-107.

Walls, Samuel (1728-95). Brit. navigator who discovered Tahiti and other Pacific isls. on voyage round the globe 1766-68, 6-29.

Wall Lizard. 4-330.

Wallons. French-speaking people of a Belgium, 1-419, 420, 4-498.

Walsend. Tn. in Northumberland Eng.; on r. Tyne, 4 m. e. of New-castle; marks e. end of Hadrian's wall; oolite; shipbuilding; pop. 18,600; 5-394.

Wall Street. New York City, financial centre of the U.S.A., 5-415.

Walmer Castle. Kent, Eng., official residence of Lord Warden of the Cinque Ports, 2-402 illus.; Wellington's death at, 7-437.

Walnut. A nut-bearing tree, 7-416; nut, 5-487 illus.; wood used in furniture-making, 3-491.

Walpole, Horace 4th Earl of Orford (1717-97). Brit. writer and wit; son of Sir Robert Walpole, 7-416; on Atmac's, 1-116; friendship with Gray, 4-68.

Walpole, Sir Hugh (1884-1941). Brit. novelist (*Mr. Perrin and Mr. Traill*; *Fortitude*; *The Cathedral*; *Harner John*; *The Lark Forest*; *Revue Horrie*; *Wintermann*), 5-473.

Walpole, Sir Robert, 1st Earl of Orford (1676-1745). First Brit. prime minister, 7-417, 7-317, 3-521; and No. 10 Downing Street, 3-110.

Walpuris [vahlp'ur-gis] or **Walburga, Saint** (c. 754-799). Eng. nun, missionary to Germany, regarded as protectress against witchcraft; hence May-Day eve, the time of witches' carnival according to Ger. legend, is called Walpuris Night; and Brocken superstition, 4-135.

Walrus. An aquatic mammal, 7-417; ivory from, 4-331.

Walsall. Mfg. tn. in Staffs, Eng.; pop. 115,511; leather goods, spirits, iron and brass products; 7-141.

Walschaert's valve gear. Type of gear used in locomotives, 5-3.

Walter, Bruno (b. 1876). German-born musician (real name Schlesinger). Conductor of opera and symphony in Vienna, Munich, Berlin; in New York 1922-26, 1932-45; musical advisor to New York Philharmonic Society, 1917-19. Became Fr. citizen in 1938; Amer. citizen 1946.

Walter, John (1739-1812). In 1781 started printing business in Printing House Square, London, and in 1785 founded *The Daily Universal Register*, the newspaper which three years later became *The Times*. His grandson, John Walter (1776-1847), transformed the small journal into a newspaper universally respected in Britain and abroad.

Waltham Abbey or Waltham Holy Cross. Eng. Market tn. in Essex on r. Lea, 12 m. s. of London; named after abbey founded by King Harold; govt. armament factory; pop. 6,197.

Walthamstow. Bor. of Essex and part of Greater London; pop. 121,069; 5-27.

Walton, Isaac (1593-1683). Eng. writer, best known for *The Compleat Angler*, 7-418, 3-286, 3-382.

Walton, Sir William Turner (b. 1902). Brit. composer. Works include a setting of Edith Sitwell's poems, *Fugade*; overture, "Portsmouth Point"; a choral fantasia "Belshazzar's Feast"; viola concerto, violin concerto, and music for film, 5-306.

Waltz. Dance in three-four time, introduced on the Continent early in the 19th century, 3-37.

Walvis Bay. Chief port of S.W. Africa, 7-80, 6-360.

Wampum. Shells used by N. Amer. Indians as money, 6-285 illus.

Wanaka, Lake. In Southern Alps, New Zealand, 6-424 illus.

Wandering Jew. Legendary character 7-418.

Wandsworth. Bor. of s.w. London, it includes dists. of Putney, Tooting, Balham, Clapham, Wandsworth, and part of Streatham. Takes its name from r. Wandlo, tributary of the Thames. Wandsworth Common is an open space of 183 acres, 5-27, 28.

Wanganui River. North Isl., New Zealand, rises at foot of Mt. Tongariro, and flows into Cook Strait after course of 200 m., 5-425 illus.

Wantage. Tn. in Berkshire, Eng.; birthplace of King Alfred; trade in agric. produce; pop. 14,590.

Wapiti [wop'ti]. A deer closely allied to Eng. red deer but much larger; is found in N. Amer., being there called elk 3-80, 6-455 illus.

War and Peace (1861). Novel by Tolstoy 5-471 7-289.

Warbeck, Perkin (1474-99). Eng. pretender, claimed to be Richard,

WASATCH

youngest of the two princes murdered by Richard III.; started several unsuccessful revolts, captured and executed by order of Henry VII.

Warblers. Birds of family *Sylviidae*, 7-418, 419 illus.

Warburg. Battle of (1760), in Seven Years' War, 7-2.

War Crimes. Tribunals at Nuremberg and Tokyo, 4-360.

Ward, Artemus. Pen-name of Charles Farrar Browne (1834-67). American humorist. (*Artemus Ward: His Book*, one of most popular series), 7-366.

Ward, Mrs. Humphry (Mary Augusta Arnold) (1851-1920). Brit. novelist, daughter of Thomas Arnold of Rugby. *Robert Fleming*, problem novel of the "battle of belief" became "talk of the civilized world" through review by Gladstone; *Marcella*; *Lady Rose's Daughter*. A social worker for children, she founded the Mary Ward Settlement.

Ward. An electoral division as in a parish; the election of guardians is elected by wards. Also a minor (under 21) in guardianship; esp. "ward in chancery," where Court of Chancery acts as guardian.

Warfare. Aeroplane, 1-27; airship, 1-83; anti-aircraft artillery, 1-171; armour, 1-243; army, 1-245; artillery, 1-258; balloons, 1-356; camouflage, 2-190; ciphers, 2-112; firearms 3-357; flying bomb, 3-403; machine gun, 5-63; mines, 5-218; naval guns, 5-353, 354, 355 illus.; navy, 5-312; rockets, 6-421; Royal Air Force, 6-460; submarines, 7-174; tanks, 7-222; torpedoes 7-291.

Warlock, Peter (1891-1930). Brit. musician (real name Philip Heseltine); notable as song composer and for editing much Elizabethan music.

Warm front. in meteorology, 5-180.

Warner, Sir Pelham ("Plum") Francis (b. 1873). Brit. cricketer. Captained Middx. (1907-20) and M.C.C. teams touring Australia (1903 and 1911) and S. Africa (1905). Pres. of M.C.C. in 1950. Wrote many books on cricket history and was founder-editor of *The Cricketer*.

War Office. The, Whitehall, London Headquarters of British Army Staff and Council; controlled by secretary of state for war, who is pres. of the army council.

Warp. In weaving, 5-36, 37, 2-256 4-335, 7-131, 435.

War Pensions. in U.K., 6-120.

Warping. See *Nautical Terms* (list).

Warp Knitting. 4-119 with illus.

Warrant. A judicial writ authorising competent officers to make arrest-search houses, and seize property-warrant of arrest, search warrant.

Warrant Officer. In British army, 1-22.

Warren. Underground rabbit colony 6-328 illus.

Warren Truss. In bridge-building, 2-64, 63 illus.

Warrington. Mfg. tn. in Lancashire. Ent. on r. Mersey; pop. 80,681 wire, tanning, soap.

Warsaw. Cap. of Poland; pop. (est. 1955,000) 7-419.

Warshe [vahr'she]. Chief tributary of r. Oder; rises N.W. of Cracow, Poland, flows N. and w., entering Gcr. and joins Oder after course of 445 m.

Wart-hog. A grotesque wild pig of Africa, 7-420, 421 illus. f.

Warwick, Richard Neville, Earl of (1428-71). Eng. statesman and soldier, called "The Kingmaker" Edward IV and, 3-167; and War of the Roses, 6-454.

Warwick. Co. tn. of Warwickshire on r. Avon; pop. 15,350; castle with many art treasures (vase from Hadrian's villa); Rom. station later fortified by Ethelbert (9th woman ruler of Mercia); 7-420.

Warwickshire. Co. of Eng.; area 975 sq. m.; pop. 1,860,874; co. tn. Warwick; 7-420.

Wasatch [waw'sach] Mts. Range

WASH

Rocky Mts. in U.S.A., beginning in s.w. Idaho and running through Utah to s.w. corner, average height 10,000 ft.

Wash, The. Shallow bay of North Sea between Lincolnshire and Norfolk. Eng., 3 217.

Washington, Booker T. (1859-1915). Amer. Negro educationist at one time a slave working in a coal mine, wrote *Up from Slavery* and *Work and the Human*.

Washington, George (1732-99). First pres. of the U.S.A., 7 420. in War of Amer. Independence, 1-134, 139. expedition to Fort Duquesne 7 2.

Washington. A Pacific coast state of U.S.A., area 69,192 sq. m., pop. 2,378,963, 7 423.

Washington, District of Columbia. Cap. of U.S.A.; pop. 802,178, 7-421; Capitol, 7 422, Pentagon, 7 422. White House, 7-422, 423 illus.

Washington, Mt. Highest mt. of White Mountains, New Hampshire, U.S.A., 6,290 ft., 1 185.

Washington Conference (1921). Held at Washington D.C. to consider limitation of armaments, Brit. Empire, U.S.A., France, Italy, Japan, China, Belgium, Netherlands, and Portugal represented. Various treaties signed

including those limiting number and tonnage of capital ships in navy and regulating use of submarines and poison gas in war.

Wasps. Four winged stinging insects of the order *Hymenoptera* 7 423, 424 illus., hibernation of queen, 4 173, insects as food stores 4-269, pollination of flowers, 3 100. how a spider kills 1-152.

Wastwater. Eng. Lake of Cumberland, 3 m. long, under 4 m. broad, one of the beauty spots of the Lake District, 4 439, 3 10 illus., 3-250.

Watches. periods into which time is divided on board ship 7 279.

Watches. See Clocks and Watches.

Water, 7-424; boiling point, 6 378, Cavendish's experiment, 2 253, chemical composition, 7 127, compression of, 4 214, consumption, 7-426, distilled, 3 93, distribution systems, 7 125, divination of, 7 427, freezing, 7 121 3 165, glycine as antifreeze, 4 37, 7-421, hard water and soap 3 78, 7 127, high specific heat of 7 124, amount in human body 6 189, hydrogen in, 4 221, formation of ice, 4 228, limestones formed by, 4-10, and living tissue, 7 125, old London's water mains 7 121 illus., and minerals necessary to plant

life, 6 215, molecule, 2-319 illus., natural circulation of 7-427, and oil 7 193 illus., pump, 6 105, purification of, 7 126, and soap, 7 127, spring 7 138, steam, 7 152 in the stratosphere 7 172, and surface tension 7 191, vapour, 1 50, 7 127, water pressure in sea, 3 9, water table 7 127, weight, 7 121. See also Hydro-electric installations.

Water Babies, The (1861). Story by Charles Kingsley, extract 4 109.

Water Bearer (Aquarius). One of the 12 signs of the Zodiac 7 521 illus.

Water beetle, 1 115, 115 illus. 4 28.

Water-busman. Aquatic insect of the *Notonecta* family, propels itself under water, produces sound by friction of a disc on its body.

"Water-break-its-Neck." Waterfall near New Radnor, Wales.

Waterbuck. African antelope, 1 56 illus.

Water-buffalo, 2 109, in India, 4 240 illus. in Sum 7 16 illus.

Water-bug. Aquatic insect of the *Notonecta* family, 4 268.

Waterbury, Connecticut, U.S.A. Mfg. centre, pop. 104,170. watches made, U.S.A. in brassware mfg. has other metal products.

GREAT WARS IN THE HISTORY OF THE NATIONS

Trojan (c. 1000 B.C.). Semi-legendary war waged by Greek princes against King Priam to avenge abduction of Helen wife of Menelaus, king of Sparta. Siege and fall of Troy.

Persian (490-479 B.C.). Expeditions of Persian emperors against Greece to punish Athens for aiding the revolt of Persian colonies. 490 Minor and to extend empire. Marathon, Thermopylae, Salamis, Plataea. Greece maintained independence and control of Aegean.

Peloponnesian (431-404 B.C.). Between Athens and Sparta for economic and political control of Greece, Athenian expedition to Syracuse, Aegospotami. Athenian supremacy ended.

Wars of Alexander the Great (334-323 B.C.). Persian Empire overthrown in battle of the Granicus, Issus, and Arbela. conquest of Syria, Palestine, and Egypt. invasion of Media.

Punic Wars (264-241, 218-202, 149-146 B.C.). Death-struggle of Rome and Carthage for dominion of Mediterranean world. Humiliating in action of Italy, battles of Cannae, Zama, Mithras. Carthage taken and destroyed.

Crusades (1096-1291). Romantic military expeditions of Western princes and prelates to recover Holy Sepulchre from Saracens. capture of Antioch, Jerusalem and Acre. Later Crusades were diverted to other ends and Holy Land fell under Moslem dominion.

Hundred Years' (1337-1453). Series of conflicts between the rulers of France and England over disputed titles to French throne and territories. Crecy, Poitiers, Agincourt. Orleans. England lost French possessions except Calais. French monarchy firmly established.

Wars of the Roses (1455-85). Waged by Houses of Lancaster and York, rival claimants to English throne until royal marriage united the two lines, Bosworth Field.

Dutch Independence (1568-1648). Initiated by William of Orange. Dutch threw off oppressive Spanish rule and established independent government. Siege of Breda.

Thirty Years' (1618-48). Struggle between Roman Catholics and Protestants of Germany in which Gustavus Adolphus of Sweden played a brilliant part. Battles of Leipzig and Lutzen. Religious and territorial differences settled at price of devastation of Germany.

Civil War (1642-49). Struggle between the British King and the Puritan Parliament over distribution of ecclesiastical and civil jurisdiction and the imposition of taxation. Battles of Marston Moor and Naseby. execution of Charles I. and establishment of Commonwealth under Cromwell.

Great Northern (1700-21). Undertaken by Russia against Denmark and Poland, to secure Baltic port. expense Sweden, sieges of Narva, Poltava. Russia gained province on Gulf of Finland. Sweden sank to second rate power.

Spanish Succession (1701-14). Attempt by Britain, Austria and Allies to prevent establishment of a French prince on Spanish throne. Blenheim, Malplaquet, Bouchon. House established in Spain, but Austria and Britain gained extensive French and Spanish possessions.

Austrian Succession (1740-48). Concerted action of Continental powers to take certain portions of Hapsburg territory from Maria Theresa, whose cause was championed by Great Britain. War ended with mutual restoration of conquests except Silesia, which was retained by Prussia.

Seven Years' (1756-63). Resulted from alliance formed against rapidly-expanding Prussia by Austria, Russia, France, and other powers. Great Britain allied with Prussia. Battles

of Rossbach, Leuthen, Quebec. Prussia established as great nation and foundations of British Empire laid.

American Independence (1774-83). Successful revolt of the Thirteen Colonies from American against British rule.

French Revolutionary (1792-99). Great Britain joined coalition of Prussia, Austria and other countries against France in contest that was last phase of long struggle between England and France for colonial and maritime supremacy, and a clash between two political systems. Valley, Italian campaign. Peace made with all Allies except Great Britain.

Napoleonic (1799-1815). Determined resistance of Allied Europe to aggression of Napoleon, ending in his downfall. Austro-Prussian, Prussian, Peninsular campaign, War 1815.

War of 1812 (1812-15). Between United States and Great Britain caused by American claims to right of search of American vessels on high seas and of impressment of American. Treaty adjusted boundaries and returned captured territory.

Crimean (1854-56). Undertaken by Great Britain with aid of other powers in defence of Turkey against Russian aggression. Siege of Sevastopol. Turkey left intact.

American Civil War (1861-65). Between Union government and Southern Confederacy over latter's attempt to secede from Union. Vicksburg, Gettysburg. Confederacy defeated.

Austro-Prussian (1866). Seven Weeks' War, arising out of dispute over possession of Schleswig-Holstein. Austria defeated at Sadowa and excluded from German federation. Prussia gained Schleswig-Holstein.

Franco-Prussian (1870-71). Clash between Prussia, Imperialistic aspirations and the jealousy of French Emperor Napoleon III, resulting in humiliating defeat of France. Downfall of the Second French Empire and proclamation of German Empire.

Russo-Turkish (1877-78). Resulted from Turkish suppression of a Bulgarian rebellion, and defeat of Serbia. Fall of Plevna. power of Turkey in Europe virtually destroyed, only to be revived by Congress of Berlin.

Chinese-Japanese (1894-95). Occasioned by rival pretensions in Korea. Victory of Japan's modern military machine over China's antiquated forces. European powers compelled Japan to restore all conquests except Manchuria.

Boer (1893-1902). Unsuccessful resistance by Boer settlers in S. Africa to extension of British claims. Orange Free State and Transvaal proclaimed British colonies.

Russo-Japanese (1904-05). Waged by Japan to halt Russian expansion in East. Siege of Port Arthur, battle of the Sea of Japan. Japanese interests in Korea recognized as paramount and Japan established as first class power.

Balkan (1912-13). Attempt by Balkan allies to expel Turkey from Europe. Remarkable successes were nullified by subsequent quarrel between Allies over newly won territory, enabling Turkey to retain Constantinople and adjoining territory.

First World War (1914-18). World-wide struggle between Central Powers against Allied and Associated Powers, arising indirectly from clash between two rival systems of commercial imperialism, and directly from international situation created by murder of Archduke of Austria by a Serb. Central Powers crushed. German and Austro-Hungarian Empires extinguished.

Second World War (1939-45). World-wide struggle between the Allies and the Axis powers (Germany, Italy, Japan), arising mainly out of clash between ideas of democracy and dictatorship as political systems. Axis powers utterly defeated.

WATER BUTTERCUP

Water buttercup, 2-136.
Water Clock, or *Clepsydra*, 2-412, 7-58.
Water-colour Painting, 6-37; in England, 8-261.
Watercress. A salad plant, 7-428.
Water Crowfoot. An aquatic plant, 7-429.
Water Dropwort. Poisonous plant, 6-237 illus.
Waterfalls, Ice Age and formation of, 4-928.
Water-fla, a minute crustacean.
Waterfoot, co. Antrim, N. Ireland, 1-178 illus.
Waterford, Irish Repub. Spt. co. tn. of co. Waterford, on estuary Waterford Harbour; pop. 28,000; stronghold of Danes; captured by Strongbow (1171); attacked by Cromwell (1649), taken by Ireton (1650).
Waterford. Co. of Munster, prof. Irish rep.; area 710 sq. m.; pop. 76,100. Industries include brewing, flour milling, fisheries. Co. tn. is Waterford. In 18th cent. was centre of Waterford glass industry.
Watergate Bay, Cornwall, Eng., 3-249 illus.
Waterglass (Sodium silicate) used for preserving eggs, 7-63.
Water Hemlock. A poisonous perennial herb found in marshes, 4-181.
Water-hole, animals at, 1-87 illus.
Water Lily. An aquatic plant, 7-428, 8-336 illus., 6-218 illus.; *Victoria regia*, 4-102.
Waterloo, Battle of (1815), 7-428, 429 illus., 4-417; artillery at, 1-260; Blücher's part in, 1-191; Napoleon after defeat, 8-320, 321 illus.; rockets used, 6-422; Wellington and, 7-437.
Waterloo Bridge, London. The old bridge, demolished in 1836, was built by Sir John Rennie 1811-17. New bridge, to design of Sir Giles Gilbert Scott, has a width of 80 ft. and consists of five 238 ft. spans. Formally opened Dec. 1945; 6-21, 2-86, 65 illus.
Waterloo Station. Principal stn. in London of the R. Region of Brit. Rlys. Opened 1848, rebuilt 1922; largest rly. stn. in Gt. Brit.
Watermark, in paper-making, 6-71.
Water Melon. Large variety of melon, 5-167.
Water Meter, for measuring amount of water consumed, 6-182; Venturi meter, 5-184 illus.
Water-paints, 6-38.
Water Petard. Original name for naval mines; first used at La Rochelle (1573), 5-219.
Water-pipes; asbestos in lagging, 1-263; freezing and bursting, 3-165; lead poisoning from, 4-163.
Water-plantain. An aquatic plant, 7-430.
Water-plants, 7-429; leaves, 4-470.
Water Polo. An aquatic ball game, 7-430.
Water-power. See Dam; Hydraulics; Hydro-electric Installations.
Water-rail (*Rallus aquaticus*). Bird, 5-334 illus., 6-353.
Water-rat. Alternative names for water vole, 6-363.
Water Shrew. Insectivorous mammal of the *Soricidae* family, total length about 6 ins.; blackish-grey above and whitish below; lives in burrows beside streams and ponds; foot, 3-413 illus.
Water-softener, 7-192.
Water speed record, 202-32 m.p.h. reached by Donald Campbell (Gt. Britain) in 1955.
Water-spider. Brit. aquatic spider, 7-134, 5-333 illus.
Water Spout, 7-430, 431 illus., 7-170.
Water Sprinklers, Automatic, 1-116.
Waterston, George (b. 1911). Scots ornithologist; and Fair Isle, 7-27.
Water-supply; aqueducts, 1-188; chlorination, 3-377; water-taster, 3-237 illus. See also Water.
Water-temperature Gauge, in motor vehicle, 6-232.
Water-tube Boiler, 1-605.
Water-turbine, in hydro-electric installations, 3-217; 4-220, 218 diag.

Water Vapour, 1-30, 7-427; condensation on ions, 4-277; from exhaust of aeroplane, 5-178.
Water Vole. Aquatic rodent; habits, 6-365.
Water-wheel, 4-64 illus. f., 4-217.
Waterwitch, H.M.S. Brit. warship propelled by hydraulic jets, 4-371.
Watford, Tn. in Hertfordshire, Eng.; brewing, printing, silk mfrs.; pop. 73,072; 4-172.
Watkins, Herbert George ("Glas") (1907-32). Brit. explorer; leader of British Arctic Air Route Expedition (1930-31, 1932); of expedition to Edge Island, Spitzbergen (1927); and to Labrador (1928); drowned off Greenland.
Watling Island or San Salvador. Small isl. of Bahamas, Brit. W. Indies, pop. 693. Thought to be San Salvador where Columbus first landed (Columbus's landing, 1-347, 2-467).
Watling Street. Old Rom. road running from Dover through Canterbury, London, St. Albans, and Dunstable to Wroxeter, Shropshire, 1-103, 5-200, 6-456.
Watson, George Lennox (1851-1904). Brit. naval architect who designed lifeboats, 4-493.
Watson, Sir William (1858-1945). Brit. poet. His best manner, reflecting Arnold, was elegiac, but diffuse.
Watson-Watt, Sir Robert (b. 1892). Brit. scientist. Head of National Physical Laboratory, 1933-36. Suggested possibility of radar for detecting aircraft, and developed radar installations during 2nd World War; investigated problems of television in cinemas; and radar, 6-337.
Watt, James (1736-1819). Brit. engineer and inventor of the steam engine, 7-431, 1-504, 4-260, 7-153.
Watt. Practical unit of electric power. It is the amount of energy expended per second by an unvarying current of one ampere at a pressure of one volt. Power in watts is obtained by multiplying current in amperes by pressure in volts. A watt is equal to one joule (q.v.) per second or 10 ergs (q.v.) per second, 3-210.
Watteau (wot'ô), (Jean) Antoine (1684-1721). Fr. painter of gay pageants of the frivolous official 18th cent.; 3-439, 6-34; The Halt During the Chase, 3-440 illus.
Watt-hour. The unit of electrical energy. It is the amount of work done by one watt acting for one hour, and is equal to 3,600 joules, or 3.6×10^{18} ergs.
Wattle. Australian plant, member of the acacias (q.v.) family. Nat. flower of Australia. Origin of name, 1-312.
Watts, George Frederick (1817-1904). Brit. painter and sculptor, 3-273, 3-262; Orpheus and Eurydice, 6-6 illus.; portrait of Shaftesbury, 7-11 illus.
Watts, Isaac (1674-1748). Eng. non-conformist divine and author of several famous hymns, 2-356, 4-226.
Watte - Dunlop, (Walker) Theodore (1832-1913). Brit. critic, poet, and author (*The Coming of Love*; *Aylwin*); and Swinburne, 6-210.
Watusi. African people of the Belgian Congo; ritual dance, 1-59.
Waugh (waw), Alec (b. 1898). Brit. novelist. Made early reputation with *The Loom of Youth* (1917), novel of public school life.
Waugh, Benjamin (1839-1908). Brit. philanthropist; foundation of N.S.P.C.C. (1884), 2-353.
Waugh, Evelyn (Arthur St. John) (b. 1903). Brit. writer, brother of Alec. *Decline and Fall* (1928) was first of a brilliant series of satirical novels. Other works (e.g. *Crackhead Revivied*) show his specifically R.C. standpoint, blog. of Edmund Campion (1935).
Waun Fach. Highest point of Black Mts., S. Wales (2,660 ft.), 2-65.
Wave. In electricity, the space form of an electrical disturbance induced

WEBB

along a conductor. Its maximum velocity is equal to that of light (186,262 miles a second). In radio, a disturbance propagated through free space and having the nature of a travelling magnetic field accompanied by an electric field at right angles to it.
Wavelength. In electrical engineering, the distance between two similar and successive points on an alternating current wave; 6-340, 311, 343; types of electromagnetic wave, 3-301; and temperature, 8-339; ultra-violet rays, 7-344; in radio, 7-432; in X-rays, 7-507.
Wavell, Archibald Wavell, 1st Earl (1883-1950). Brit. soldier. G.O.C. Middle East (1940-41), 7-489; c.-in-c. India (1941-43); Viceroy (1943-47). Created earl in 1947. Constable of the Tower of London (1948-50).
Wave Mechanics, De Broglie and, 6-319.
Wave Motion, 7-422; and the ether, 3-301; in light and colour, 2-462; interference colours, 2-463; sound waves, 7-86, 87, 88, 7-343, 344 light waves, 4-500.
Waveney, R. of Norfolk and Suffolk, 50 m. long; 7-182.
Waverley, John Anderson, Viscount (b. 1882). Brit. politician and civil servant; lord privy seal, 1938-39; home sec., 1939-40; gave name to Anderson air-raid shelter. Lord pres. of council, 1940-43; chancellor of exchequer, 1943-45.
Waverley Novels. Alternative name for the novels of Sir Walter Scott so-named for the first of them, *Waverley*, pub. anonymously 1814. Later works were pub. as "By the author of Waverley," 6-517.
Waxes. See Wave Motion.
Wax. A substance of animal, mineral or vegetable origin, 7-432; in ear, 3-148; produced by bees, 1-405.
Wax Myrtle. See Bayberry.
Wax Palm, tree native to Colombia, S. Amer., 6-51 illus.
Waxwing. Passerine bird, of genus *Bombus*, occasionally seen in Eng.; so named from wax-like scales on wing-feathers; migration, 5-204 illus. f.
Weald, The. Dist. of s.e. Eng. between N. and S. Downs; formerly forested; 3-110, 3-248, 4-398.
Wealth. In economics, 3-159.
Weapons, 1-245. See also Artillery. Firearms; Flying Bomb; Machine-gun; Mines in Warfare; Rocket; Tanks; Torpedo.
Wear. R. of Durham, Eng.; source near Cross Fell, whence it flows s. for over 65 m. to the North Sea at Sunderland, 3-139, 140 illus.
Weasel. A small carnivorous mammal, 7-433.
Weather, 7-433, 7-169; balloons in weather forecasting, 1-355; barometer, 1-370; charts, 5-179; cloud, 2-121; cyclone, 3-16, dew 3-82 fog, 3-405; frost, 3-477; in Gt. Brit., 5-179 illus.; information signals, 7-52; lightning, 4-504; maps, 7-433 illus.; meteorology, 5-178, rainbow, 6-360; rainfall, 6-360 storms, 7-169; and troposphere, 1-81; typhoon-observatory, 6-113 wind, 7-457.
Weather-house. Form of barometer, 1-372, 371 illus.
Weather Ships, in meteorology service, 5-180.
Weaver. R. in Cheshire, Eng., trib. of Mersey; 46 m. long.
Weaver Bird. A finch-like bird, family *Ploceidae*, native to Africa, s. Asia, Australia. Name derived from nest of varying size and shape, built by interweaving grass, leaves and vegetable fibre.
Weaver's Knot, how to tie, 4-121 illus.
Weaving, 7-433, 434 illus.; carpets, 2-246, 247 illus.; Jacquard loom, 4-348; compared with knitting, 4-419; loom, 5-36, 2-256; tapestries, 7-234.
Webb, Sir Aston (1849-1930). Brit. architect; designed Victoria and

WEBB

Albert Museum, 6-26 illus.; Admiralty Arch, 5-31 illus.; new front of Buckingham Palace.

Webb, Mary (1851-1927). Brit. novelist, depicted rural life in Shropshire (*Providence House* and others).

Webb, Matthew (1848-83). First to swim English Channel (1875), 7-210.

Webb, Sidney (James) (1859-1947) or **Lord Passfield**. Brit. politician, economist and Fabian socialist, collaborator with his wife, Beatrice Potter Webb (*History of Trade Unionism*; *Industrial Democracy*; *Social Communism*); Labour M.P. 1922-29; pres. of board of trade, 1924; dominion sec. 1929-30; colonial sec. 1929-31; created Baron Passfield (1929); O.M. 1944.

Weber [və'ber]. Carl Maria von (1786-1826). Ger. composer, founder of romantic school of Ger. opera (*Der Freischütz*; *Invitation to the Waltz*; *Oberon*); 5-514.

Weber. The practical unit of magnetic flux. It corresponds to 10 maxwells (g.s.).

Webster, John (c. 1580-1625). Eng. dramatist who mainly collaborated with other dramatists. Among his independent works are the tragedies *The Duchess of Malfi* and *The White Devil*; 2-119, 3-285.

Webster, Noah (1758-1843). compiler of first Amer. dictionary of Eng. language, 3-88, 7-129.

Weddell, James (1787-1834). British Antarctic explorer; discovered Weddell Sea in 1823.

Weddell Sea, Antarctica, 1-163.

Weddell Seal, 1-160.

Wedding of the Sea. Venetian custom of throwing a ring into the sea, to symbolise the city's dominion over the Adriatic 1-21, 7-387.

Wedgwood, Josiah (1730-95). Most famous Eng. potter; originator of "Wedgwood ware" and "Queen's ware" (named in compliment to Queen Charlotte); 6-277, 276 illus.

Wedomere, Treaty of (878). Treaty made between Alfred the Gr. and Danes at village of Wedmore in Somerset, Eng., 1-103.

Wednesday, 4th day of week; origin of name, 3-55, 5-500.

Week. A division of time, 7-435.

Weekly News. First regular weekly newspaper in Eng.; was started in London in 1622, 5-107.

Weems, Mason (1759-1825). Amer. clergyman, biographer of George Washington; responsible for traditional cherry tree story; 5-143.

Weeping Willow. A tree, 7-455.

Weevil. Name given to beetles of the family *Curculionidae*, numbering about 40,000 known species, 7-435; camouflage, 4-265 illus.

Weft, in weaving, 2-256, 4-335, 5-36, 37, 7-434.

Weight, an expression of gravity, 4-86.

Weight, Putting the. In athletics, 1-290, 292, 291 illus.

Weights and Measures, 7-435; metric system, 5-184. See also lists.

Weihsaiwei [wäi'wäi]. Port and naval base on N.E. coast of Shantung, China; area 285 sq. m.; pop. 178,900; leased by Gr. Brit. in 1898; restored to China in 1930.

Wei-ho [wäi'ho]. In N. China, largest trib. of Yellow r.; flows E. 500 m. and joins Yellow r. at point where it turns from S. to E.; trade route from interior.

Weller, Dr. L. German pioneer of television; used a drum of mirrors as a scanning device, 7-253.

Weimar [vi'mah]. Tn. of E. Germany, in Land of Thuringia; pop. 67,000. The Weimar republic, colloquial name for the govt. of Germany 1919-33, was so named because the assembly which created it was held here, 4-4.

Weinberg (vīn'bērk). Tn. of Ger., 28 m. N.E. of Stuttgart; victory of Ger. king Conrad III over Count Welf of Bavaria (1140); once free imperial city.

Weismann (vī'mahn), August (1834-1914). Ger. biologist; advanced theory that changes in the charac-

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teristics of a species are due to changes in germ-plasm, 3-324.

Weissenburg, Battle of (1870), in Franco-Prussian War, 3-458.

Weismann, Chaim (1874-1959). First president of Israel (1948); Russian biochemist; for many years president of the World Zionist Organization, 4-302.

Welding. A process of joining metals, 7-436, 1-129.

Welfare work, by Red Cross, 6-371.

Well, artesian, 1-254.

Welland, R. of Eng., 70 m. long, 5-456, 4-476, 4-512, 6-482.

Welland Canal. Canadian waterway connecting Lakes Erie and Ontario; part of the Great Lakes-St. Lawrence r. route from the Atlantic to the heart of N. Amer. Length 25 m. Seven locks, each with lift of 44½ ft., overcome the 325 ft. difference in elevation between the two lakes; 2-525, 4-68, 5-513.

Welllesley, Richard Colley Welllesley, Marquis of (1760-1842). Brit. statesman, one of greatest colonial administrators; gov. gen. of India (1797-1805); "found the (Brit.) East India Co. a trading body, left it an imperial power"; older brother of Duke of Wellington.

Wellington, Arthur Welllesley, 1st Duke of (1769-1852). Brit. soldier and statesman, 7-436 and Bilderer, 1-494 illus.; in Peninsular War, 6-116, 147, as prime minister, 7-437; at Waterloo, 7-428; gift of clms at the Alhambra, 1-111.

Wellington, Tn. in Shropshire, Eng.; pop. 11,412; 7-44.

Wellington, Cap. of New Zealand, on N. Island; pop. 140,400, 7-437.

Wellington bomber, aeroplane, 1-36 illus.

Wellington College, Berks, Eng. Founded by public subscription in honour of Duke of Wellington and incorporated in 1853; provides for education of sons of army officers.

Wellingtonia, Sequoia, or Redwood. A giant evergreen tree, 7-437, 438 illus., 3-421, 2-483, 7-309 illus. f.

Wellman, Walter (1858-1934). Amer. explorer; made two unsuccessful attempts (1907 and 1909) to reach North Pole by airship; first to try to cross the Atlantic by airship (1910).

Wells, Herbert George (1860-1946). Brit. novelist, 7-438, 5-470, 473, 3-291; and Chesterton, 2-332.

Wells, Horace (1815-48). Amer. dentist, early user of anaesthetics; use of nitrous oxide in tooth extractions, 1-142.

Wells. Cathedral city, in Somerset, Eng. Pop. 5,835; 7-439, 7-84; cathedral, 2-272 illus.

Wells-next-the-Sea. Holiday resort on Norfolk coast; pop. 2,592; 5-448.

Welsbach [vel'sbakh], Karl Auer, Baron von (1858-1929). Austrian chemist and inventor, discoverer of rare elements and inventor of Welsbach light and osmium incand. descent electric light; and gas mantle, 3-503.

Welsh Corgi, dog, 3-101, illus. &

Welshpool. Tn. in Montgomeryshire, Wales; pop. 6,034; 5-255.

Welt, in shoemaking, 2-16.

Welwyn Garden City [wel'in]. Between Welwyn and Hatfield in Herts Eng.; a planned town, laid out in 1920, 4-173.

Wem'bley, Bor. of Middx., 8 m. N.W. of London; pop. 131,369; in 1924-25 scene of great British Empire Exhibition, 3-328; stadium used for F.A. Cup final and international matches, Rugby League final, greyhound and speedway racing, 5-200; Empire Pool and Arena opened in 1934; 5-27.

Wemyss Bay [wēms]. Holiday resort on the Firth of Clyde, Renfrewshire, Scot., 6-388.

Wenceslas, or Václav (d. c. 929). Bohemian prince (Good King Wenceslas of the carol), 1-503.

Wendelstein, Mt. in Bavaria, Ger., many, 6,031 ft. high, 1-388 illus.

WESTERN AUSTRALIA

Wendover, Tn. in Bucks, Eng.; near by is Chequers, the country home of Brit. prime ministers; pop. about 5,000.

Wends. Slavic race-group, 7-66.

Wendy. In full, Wendy Meira Angela Darling, child heroine of Barrie's fantasy *Peter Pan*, 1-373.

Wener Lake. See *Váner*.

Wensleydale. Valley of E. Yre in N. Riding of Yorks, Eng.; famous for cheese; named after vill. of Wensley 7-515.

Wensleydale sheep, 7-22.

Wen'sum. R. of Norfolk, Eng.; rising in the N. of the co., joins the Yare near Norwich; 30 m. long.

Wenzel [vənt'sel] or **Wenceslas** (1361-1419). King of Bohemia and Holy Roman emperor; his attempt to settle the Great Schism antagonised Archbishop of Mainz, who persuaded the Imperial electors to depose him.

Werfel, Franz (1890-1945). Austrian novelist and poet; *Verdugo* (1924), *Paul among the Jews* (1926), *The Song of Bernadette* (1942); 4-21.

Wergeland, Henrik (1808-45). Norwegian writer and poet, 5-167.

Werner [vāner], **Zacharias** (1768-1823). Ger. romantic dramatist; *Martha Luther* and *Der 21 Februar* his best plays, are typical of the lurid "late tragedy"; became a R.C. priest (1814).

Wesel [və'sel]. Tn. of w. Ger., in Land of N. Rhine-Westphalia; destroyed by bombing in 2nd World War; Rhine bridge blown up in 1915; pop. 43,150.

Weiser [vā'zer]. R. of Germany rising in a Hanover; flows N. 280 m. to North Sea; 4-1.

Wesley, Charles (1707-88). Brit. cleric and hymn-writer (brother of John); 7-440, 4-226.

Wesley, John (1703-91). Brit. cleric and founder of Methodism, 7-439, 3-164, 2-381; dictionary, 3-88.

Wesley, Susanna (1669-1742). Mother of John and Charles Wesley, founders of Methodism; treatment of children, 2-333.

Wessel, Horst (1907-30). Ger. Nazi bravo, elevated to status of martyr by that party, on strength of alleged murder by Communists. The Horst Wessel song (a good tune of ultimate Salvation Army origin) became a second Ger. nat. anthem during Nazi régime.

West Sax. Anc. kingdom of W. Saxons in s. Britain; founded by Cerdic and Cynric in 519; Egbert became king 802, and later ruled all Britain; 3-276; Alfred's defence against the Danes, 1-103. The term *Westsex* was later revived by Thomas Hardy for the fictitious topography of his novels, actually laid in Dorset, Wilts, Bucks, Hants, etc., 4-131.

West, Benjamin (1738-1820). Amer. historical painter; 3-263, 264; and Gray, 4-68; portrait of William Penn, 6-117 illus.

West, Rebecca (b. 1892). Pen name of Mrs. Henry Maxwell Andrews. Brit. writer (*Henry James*; *The Strange Necessity*; *Harriet Hume*; *The Thinking Reed*).

West Africa, 7-440; Nigeria, 5-435; driver ants, 1-162; mahogany, 5-87.

West Bengal. State of Repub. of India. Area 29,533 sq. m.; pop. 24,800,000. Cap. Calcutta, pop. 4,000,000; 1-429.

West Bromwich. Mfg. tn. in Staffs, Eng.; pop. 97,985; coal and iron; 7-111.

Westbrook, Harriet (c. 1794-1816). First wife of Percy Bysshe Shelley, 7-26.

Westermarck, Edward Alexander (1862-1939). Finnish anthropologist and author, professor of sociology at London Univ. (*Origin and Development of the Moral Idea*; *History of Human Marriage*).

Western Australia. State of the Australian Commonwealth; area 975,920 sq. m.; pop. 581,486; cap. Perth; 7-441, 1-318.

WEIGHTS AND MEASURES IN COMMON USE

MEASURES OF LENGTH

- 12 inches = 1 foot (ft.)
- 3 feet = 1 yard (yd.)
- 1/2 yards (10 1/2 ft.) = 1 rod, pole, or perch
- 40 rods = 1 furlong
- 8 fur. (1,760 yds) = 1 mile

'Surveyors' Measure

- 7 02 inches = 1 link
- 25 links = 1 rod
- 4 rods (100 links) = 1 chain
- 10 chains = 1 furlong
- 8 fur. (80 chains) = 1 mile

Nautical Measures

- 6 feet = 1 fathom
- 100 fathoms = 1 cable
- 10 cables = 1 nautical mile
- 6,080 feet = 1 Admiralty mile

Strictly speaking, the nautical mile is one minute of latitude, and is consequently rather more than 20 yds longer at the poles than the equator. For practical purposes it is taken as equal to the Admiralty mile. The discrepancy between this (6,080 ft.) and 10 cables (6,000 ft.) is unimportant, since the cable is used only in estimating distances by eye.

A knot is a speed of 1 nautical mile per hour. The expression "knots per hour" is wrong.

MEASURES OF AREA

- 44 square inches (sq. in.) = 1 square foot (sq. ft.)
- 9 square feet = 1 square yard (sq. yd.)
- 30 1/2 square yards = 1 square rod, pole, or perch
- 40 square rods = 1 rood
- 4 rods (10 sq. chains) = 1 acre
- 640 acres = 1 square mile

MEASURES OF CAPACITY

Cubic Content

- 1,728 cubic inches (cu. in.) = 1 cubic foot (cu. ft.)
- 27 cubic feet = 1 cubic yard (cu. yd.)
- 277.27 cubic inches = 1 British imperial gallon
- 1 cubic foot of water weighs about 62.5 pounds.
- (Capacity liquid or dry)

- 4 gills = 1 pint
- 2 pints = 1 quart
- 2 quarts = 1 gallon

Dry Measure

- 2 gallons = 1 peck
- 4 pecks = 1 bushel
- 8 bushels = 1 quarter
- 30 bushels = 1 chaldron

Beer and Ale

- 1 pin = 4 1/2 gallons
- 1 firkin = 9 gallons
- 1 kilderkin = 18 gallons
- 1 barrel = 36 gallons
- 1 hogshead = 54 gallons
- 1 butt = 108 gallons
- 1 tun = 216 gallons

Apothecaries' Liquid Measure

- 60 minims = 1 fluid drachm (ʒi)
- 8 fl. drachms = 1 fluid ounce (ʒi)
- 20 fl. ounces = 1 pint

MEASURES OF WEIGHT

Avoirdupois

- 16 drams (dr.) = 1 ounce (oz.)
- 16 ounces = 1 pound (lb.)
- 14 pounds = 1 stone
- 2 stones = 1 quarter
- 4 quarters (112 lb.) = 1 hundredweight (cwt)
- 20 cwt. (2,240 lb.) = 1 ton
- Troy (precious stones and metals)
- 4 grains = 1 carat
- 6 carats (24 grains) = 1 penny weight (dwt.)
- 20 dwt. = 1 ounce
- 12 ounces = 1 pound

The pound troy, which was 5,760 grains, as against 7,000 grains for the pound avoirdupois, is no longer used, and gold and silver are now weighed in ounces and decimals of an ounce; precious stones in international carats of 200 (instead of 250) milligrams.

Apothecaries' Weight

- 20 grains = 1 scruple (ʒi)
- 3 scruples = 1 drachm (ʒi)
- 8 drachms = 1 ounce (ʒi)

The apothecaries' ounce is thus the same as the ounce troy.

ANGULAR MEASURES

- 60 seconds (") = 1 minute (')
- 60 minutes = 1 degree (°)
- 90 degrees = 1 right angle
- 57.29578° = 1 radian
- 1/2π radians = 1 right angle

MEASURES OF TIME

- 60 seconds = 1 minute
- minute = 1 hour
- 24 hours = 1 day
- 7 days = 1 week
- 4 weeks = 1 lunar month
- 365 days = 1 year
- 366 days = 1 leap year

COUNTING

- 12 things = 1 dozen (doz.)
- 13 things = 1 baker's dozen
- 12 dozen = 1 gross
- 12 gross = 1 great gross
- 20 things = 1 score

COMMON HOUSEHOLD MEASURES

- 4 teaspoons = 1 tablespoon
- 2 tablespoons = 1 fluid ounce
- 8 fl. oz. (16 tablespoons) = 1 cup
- 1 cup dry crumbs = 2 oz.
- 1 cup flour = 4 oz.
- 1 cup raisins or currants = 6 oz.
- 1 cup granulated sugar = 8 oz.

SOME MISCELLANEOUS UNITS

- 1 atmosphere (pressure) = 14.7 lb. per sq. in.
- = 34 ft. head of water
- = 29.92 in. of mercury
- = 1.013 bar
- 1 horse-power (h.p.) = 550 ft. lb. per sec.
- = 746 watts
- 1 lb. wt. (force) = 32 poundals
- 1 span (cloth) = 9 inches
- 1 hand (horses) = 4 inches
- 1 point (type size) = 1/72 inch
- 1 cord (wood) = 128 cu. ft.
- 1 astronomical unit = 92,900,000 miles
- 1 light-year = 5.88 × 10¹² miles
- 1 parsec = 19.16 × 10¹² miles

METRIC AND BRITISH WEIGHTS AND MEASURES

Some Useful Conversion Factors

BRITISH—METRIC

METRIC—BRITISH

Long Measure

1 inch = 2.54 centimetres
1 foot = 3.048 decimetres
1 yard = 0.914 metre
1 mile = 1.6093 kilometres

1 centimetre = 0.394 inch
1 decimetre = 0.328 foot
1 metre = 1.094 yards
1 kilometre = 0.621 mile

Square Measure

1 sq. inch = 6.452 sq. centimetres
1 sq. foot = 0.29 sq. decimetres
1 sq. yard = 0.836 sq. metre
1 acre = 0.405 hectare
1 sq. mile = 2.590 sq. kilometres

1 sq. centimetre = 0.155 sq. inch
1 sq. decimetre = 0.108 sq. foot
1 sq. metre = 1.196 sq. yards
1 hectare = 2.471 acres
1 sq. kilometre = 0.386 sq. mile

Cubic Measure

1 cu. inch = 16.387 cu. centimetres
1 cu. foot = 28.317 cu. decimetres
1 cu. yard = 0.765 cu. metre

1 cu. centimetre = 0.061 cu. inch
1 cu. decimetre = 0.035 cu. foot
1 cu. metre = 1.308 cu. yards

Avoirdupois Weight

1 grain = 64.799 milligrams
1 grain = 0.065 gram
1 dram = 0.177 decagram
1 ounce = 0.284 hectogram
1 pound = 0.454 kilogram
1 quarter = 1.27 myriagrams
1 hundredweight = 0.508 quintal
1 ton = 1.016 tonnes

1 milligram = 0.015 grain
1 gram = 15.432 grains
decagram = 5.644 drams
hectogram = 3.527 ounces
1 kilogram = 2.205 pounds
myriagram = 0.787 quarter
1 quintal = 1.008 hundredweights
1 tonne = 0.984 ton

Troy Weight

1 grain = 64.799 milligrams
1 carat = 0.250 gram
1 pennyweight = 0.156 decagram
1 ounce = 0.311 hectogram
1 pound = 0.373 kilogram

1 milligram = 0.015 grain
1 gram = 3.858 carats
1 decagram = 0.431 pennyweights
1 hectogram = 3.215 ounces
1 kilogram = 2.667 pounds

Apothecaries' Weight

1 grain = 0.48 decigrams
1 scruple = 1.296 grams
1 drachm = 0.389 decagram
1 ounce = 0.311 hectogram
1 pound = 0.373 kilogram

1 decigram = 0.154 grain
1 gram = 0.772 scruple
1 decagram = 2.672 drachms
1 hectogram = 3.202 ounces
1 kilogram = 2.668 pounds

Dry Measure

1 gill = 14.2 centilitres
1 pint = 5.682 decilitres
1 quart = 1.136 litres
1 gallon = 0.455 decalitre
1 peck = 0.909 decalitre
1 bushel = 0.364 hectolitre
1 quarter = 0.201 kilolitre

1 centilitre = 0.07 gill
1 decilitre = 0.176 pint
1 litre = 0.879 quart
1 decalitre = 2.2 gallons
1 decalitre = 1.1 pecks
1 hectolitre = 2.75 bushels
1 kilolitre = 3.434 quarters

Liquid Measure

1 minim = 0.059 millilitre
1 drachm = 0.355 centilitre
1 fluid ounce = 0.284 decilitre
1 pint = 0.568 litre
1 quart = 1.136 litres
1 gallon = 0.455 decalitre

1 millilitre = 16.89 minims
1 centilitre = 2.817 drachms
1 decilitre = 3.519 fluid ounces
1 litre = 1.76 pints
1 litre = 0.88 quart
1 decalitre = 2.2 gallons

FOREIGN WEIGHTS AND MEASURES

United States
 1 long ton = 2,240 pounds
 1 short ton = 2,000 pounds
 1 bushel = 2,150.42 cu. inches
 1 gallon = 268.8 cu. ins.
 1 gallon (8 pints) = 0.833 imperial gallon
 1 pint = 16 fluid ounces

The following countries use the metric system: Argentina, Belgium, Bolivia, Brazil, Bulgaria, Chile, Czechoslovakia, Denmark, Dominican Republic, Ecuador, Egypt, Finland, France, Germany, Haiti, Honduras, Hungary, Italy, Japan, Malta, Mexico, Netherlands, Nicaragua, Norway, Paraguay, Portugal, Rumania, South Africa, Spain, Sweden, Switzerland, Uruguay, U.S.S.R., Venezuela. Some have also national weights and measures.

OLD WEIGHTS AND MEASURES

Ancient Rome
 1 digitus = 0.73 inch
 1 Roman foot = 0.973 foot
 1 gradus = 2.42 feet
 1 actus = 110.4 feet
 1 Roman mile = 4,805 feet
 1 as = 0.72 pound
 1 uncia = 420 grains
 12 unciae = 1 libra
 125 librae = 1 talent
 1 bes = 0.48 pound
 1 denarius = 60.16 grains
 1 obolus = 8.77 grains
 1 scrupulum = 17.53 grains

South Africa
 1 morgen = 2.117 acres
 1 Cape lineal foot = 1.033 feet
 1 short ton = 0.802 ton
 1 leaguer = 128 gallons
 half aum = 15.5 gallons
 1 anker = 7.5 gallons
 1 quid = 3 bushels

Channel Islands

JERSEY

1 vergee = 0.44 acre
 1 bushel = 8.0 gallons
 1 pound = 7,561 grains
 1 cwt. = 112.3 pounds

GUERNSEY

1 vergee = 0.4 acre
 1 bushel = 5.8 gallons
 1 pound = 7,623 grains
 1 cwt. = 108.9 pounds

Germany

1 morgen = 0.63 acre

Palestine

1 talmod cubit = 21.914 inches
 1 Egyptian cubit = 18.24 inches
 1 cubit of Ezekiel = 25.26 inches
 1 reed = 151.6 inches
 1 ktklar (talent) = 3,000 shekels
 1 shekel = 0.5 ounce
 1 bath (epha) = 6.477 gallons
 1 cor (10 ephas) = 8.351 bushels

Western Ghats (gawti). Range of mts. along the Malabar coast of India; average height 8,000 ft., 4-240.

Western Union. Economic, milit. and cultural alliance between the U.K., Fr., Belgium, Netherlands, Luxemburg; entered into March 17, 1948, in 50-yr. treaty signed at Brussels; the military section (defence council) was merged, 1950, in command of the N. Atlantic Treaty Organization.

West Ham. Bor. of Essex, Eng., in Greater London area, on the Thames; has large docks, and railway workshops; pop. 170,987; 6-27.

West Highland Terrier. Dog, 3-100 lbs., f.

West Indies. Isl. group (40 inhabited), curving round from Florida, U.S.A., to Venezuela in S. America; total area about 100,000 sq. m.; est. pop. 13,000,000; 7-442, 1-136; iguanas, 4-235; sugar, 7-185 illus. See also names of individual isls.

West Indies University College, Mona, Jamaica; founded 1946, with faculties of medicine, natural sciences and arts.

Westinghouse, George (1846-1914). Amer. engineer, inventor of the air-brake, 2-42.

West Linton. Holiday resort in Peeblesshire, Scot.; pop. 1,623; 6-104.

West Lothian. Scot. co., area 120 sq. m.; pop. 88,576; co. tn. is Linlithgow; 5-39.

Westmeath, Irish Republic. Inland co. in Leinster; agric.; area 681 sq. m.; pop. 54,471; co. tn. Mullingar.

Westminster. City and bor. of London; pop. 98,895; royal palaces, Westminster Abbey, Houses of Parliament, R.C. Cathedral, National and Tate Galleries, govt. offices, Whitehall, 5-19, 2-264, 7-353 illus.

Westminster, Palace of. The correct name for the U.K. Houses of Parliament, 6-88.

Westminster, Statute of (1931), 2-84, 6-202.

Westminster Abbey. The Collegiate Church of St. Peter, London, 7-442, 443, 444 illus., 5-24; Edward the Confessor and, 5-19; R.A.F. memorial chapel, 2-79.

Westminster Cathedral. Chief Roman Catholic church in England, near Victoria Street, London; built of red brick in early Byzantine style, architect J. F. Bentley; campanile 286 ft. high; consecrated in 1903.

Westminster Hall, London. Adjoins Houses of Parl., built in 11th cent. by William I; Charles I was tried here; 5-23, 6-88.

Westminster School, London. Public school, formerly associated with Westminster Abbey; refounded by Henry VIII, later by Elizabeth I; built round Little Dean's Yard; 7-444, 5-28, 6.

Westmorland. A N.W. co. of Eng.; area 789 sq. m.; pop. 67,383; co. tn. Appleby; 7-444, 4-438 map.

Weston, Dame Agnes E. (1840-1918). Brit. philanthropist; known as the Sailor's Friend; in 1876 opened a Sailors' Rest at Devonport and later at Portsmouth.

Weston-super-Mare. Popular holiday resort in Somerset, Eng., on Bristol Channel, 18 m. s.w. of Bristol; pop. 40,165; 7-85.

Westphalia. Former prov. of Prussia, added in 1945 to Lippe and part of Rhine prov. to form Land of North Rhine-Westphalia, W. Germany; cap. Düsseldorf.

Westphalia, Treaty of (1648). Treaty ending the Thirty Years' War. 7-270, 1-417, 3-451.

West Point, New York, U.S.A. Military garrison on Hudson r. 62 m. from New York City; U.S. military academy; 5-421.

West Prussia. Former prov. of Ger. on Baltic; area 9,800 sq. m.; by Treaty of Versailles (1919) larger part went to Poland; remainder incorporated in Border Prov. (Grenmark) until 1945, when it became part of Poland.

West Punjab (Pakistan). See Punjab.

West Virginia. A middle Atlantic state of the U.S.A.; area 24,181 sq. m.; pop. 2,805,550; 7-403.

Wet-and-dry-bulb Hygrometer. See Psychrometer.

Wethered, Joyce (b. 1901). Brit. golfer; the greatest woman golfer in the history of the game; her brother Roger Henry (b. 1899) was also a noted golfer; 4-44.

Wetherham. Mt. in Lake Dist., Eng., 2,502 ft., 4-438.

Wetterhorn. Mt. in Swiss Alps, 1-126.

Wewak. Harbour and airfield on coast of N.E. New Guinea; taken by Japs. Mar. 1942, and used as supply base; its airfield was a target for Allied air attack; retaken by Australian troops June 5, 1945.

Wexford, Irish Rep. Spt. and co. tn. of co. Wexford, in s.e. on Wexford Harbour; pop. 17,420; taken by Cromwell (1649); headquarters of the United Ireland rebels (1798).

Wexford, Irish Republic. Marit. co. in Leinster; agric.; area 908 sq. m.; pop. 89,993; co. tn. Wexford.

Wey, R. of. Surrey, flows 35 m. to the Thames at Weybridge; 7-186.

Weyden (v'den), Roger van der (originally Roger de la Pasture) (c. 1400-64), Flemish painter, 5-381.

Weygand (vā'gahn), Maxime (b. 1867). Fr. general; chief of F.R.'s staff during 1st World War; High Commissioner of Syria (1923); chief of staff (1930); c-in-c. in 1940; his property sequestered for collaboration Sept. 1945; 3-136.

Weyman, Stanley John (1855-1928). Brit. novelist; achieved much success with historical romances. (*The House of the Wolf*; *A Gentleman of France*; *Under the Red Robe*).

Weymouth, George (17th cent.). Eng. explorer; employed by E. India Co to seek for north-west passage to India, 1-131.

Weymouth, Richard Francis (1822-1902). Brit. philologist; the *New Testament in Modern Speech*, 1-343.

Weymouth. Spt. and resort of Dorset Eng., on Weymouth Bay; pop. 37,097; shipping and passenger trade with Channel Is.; ship building, stone-quarrying, 3 107 figures as Hudmouth in Thomas Hardy's novels.

Whale. Large sea-mammal of fish-like form, 7-445, 5-100, 5-129 flipper, 4-125 illus.; food, 5-498 teeth, 5-102; ability to withstand change in water pressure, 5-496.

Whalebone, 7-445, 5-102.

Whalebone Whale. See Baleen Whale.

Whale Island. Naval gunnery school at Portsmouth, 6-266.

Whale Oil, in margarine, 5-121.

Whale Shark. The largest living fish 7-18.

Whalley, Edward (d. c. 1678). One of Cromwell's generals, signed death warrant of Charles I. After restoration fled to America.

Wharfe. R. of Yorkshire, flows 60 m. to join the Ouse; Wharfedale 7-315 illus.

Wharton, Edith (1862-1937). Amer. novelist, 7-365.

Wheat. Cereal plant, 7-447; flour and bread yield from, 2-430, 3-391 harvest, 4-134; Manitoba hard 5-114; protein in, 6-297; wheat rust, 6-461; and windmill, 7-469 460.

Wheatsear. A bird, 7-448; migration 5-204 illus. f.

Whetley, Francis (1747-1801). Brit. painter, best remembered for his series *The Cries of London*, 3-204.

Wheatstone, Sir Charles (1802-75). Brit. physicist; inventor of early electric telegraph system; inventor of stereoscope, 7-166.

Wheel, 7-448; flanged wheel on rly 6-356, 5-4 diag.; and pulley, 6-302 and road transport, 6-410; and turbines, 7-329.

Wheel-and-axle, in mechanics, 5-157 6-303.

Wheel Bug. Insect of s. U.S.A., with

WHEELER PEAK

semi-circular elevation on thorax like toothed wheel; eggs 8-171 dia.
Wheeler Peak, highest point in New Mexico, U.S.A.; 13,161 ft., 8-400.
Wheeling, W. Virginia, U.S.A. Shipping and industrial centre and largest city in state; in extreme N. on Ohio r.; pop. 58,890; iron and steel, pottery, glass, tobacco.
Wheel-lock Gun, 8-359, 358 illus.
Wheelwright, a maker of wheels for vehicles, 7-448.
Whale, Large marine mammal used for bait and for food; 7-24 illus. f.; egg, 3-171 dia.
Wharfedale, Mt. of Yorks, Eng.; one of highest peaks of Pennine range, forms conspicuous landmark where Yorks, Westmorland, and Lancs join; 2,414 ft. high, 6-118.
Whig party in Brit. politics; Liberal party a descendant of, 4-485; and Tories, 2-487.
Whin, See Gorse.
Whinchat, Small migratory Brit. bird, related to wheatear, 7-148; migration, 6-204 illus. f.
Whip, In British politics, an official whose duty it is to see that the members of his party vote for the party. The Chief Whip is also guardian of the party funds; 6-90.
Whip Coral, 6-129 illus. f.
Whip-poor-will, Bird native to N. Amer. Name derived from its peculiar cry uttered after sunset.
Whipsnade, A country "zoo" belonging to the Zoological Society of London. It is an area of 500 acres on the Chiltern Hills, Beds., developed as a park for wild animals and also as a sanctuary for British wild birds and plants, 7-525, 526 illus.; wolves at, 7-464 illus.
Whirlig Beetle, A water beetle, 1-415; eye, 3-333 illus.
Whirlpool, An eddy or vortex resulting from the meeting of two currents of water flowing in different directions.
Whirlwind, A funnel-shaped column of air moving spirally round an axis, which at the same time has a progressive motion; it is purely local.
Whiskers, in mammals, 5-100.
Whisky or Whiskey, 7-136, 137; distilling, 3-94, 5-97; rye, 6-482. (Scotch whisky is usually so spelt, but the Irish form is whiskey).
Whispering Gallery, at St. Paul's cath., London, 6-487.
Whistler James Abbot McNeill (1834-1903), Amer. painter and etcher; lived in Eng. from 1863, 3-262; on Cézanne, 2-298; portrait of Carlyle, 3-262 illus.
Whistler, Rex John (1903-44), Brit. artist. Illustrated books and designed stage scenery. Killed in action.
Whitaker's Almanack, Work of general reference publ. annually in Great Britain, 1-117.
Whitby, Seaport and holiday resort of N. Yorks, Eng., at mouth of r. Esk; once famous for shipbuilding and ornaments of local jet; ruins of 12th cent. abbey founded 657; pop. 11,886. Synod of Whitby (664) established adherence of Eng. Church to Roman method of observing Easter.
White, Andrew Dickson (1832-1918), Amer. diplomat and educator; first pres. of Cornell Univ. (1867-85); minister (1879-81) and ambassador (1897-1902) to Ger.; ambassador to Rus. (1892-94).
White, Gilbert (1720-93), Brit. country parson, naturalist, and author. Best known work *The Natural History and Antiquities of Selborne*.
White Admiral butterfly, 2-138 illus.
White Ants, See Termites.
Whitebait, The young of herrings and sprats, 4-171, 172.
Whitebeam, Deciduous tree, *Pyrus arla*. Height up to 40 ft. Leaves grey-green, thickly coated with white down underneath. Flowers small, white, in flat clusters, succeeded by green-dotted scarlet berries.
White Bream, Brit. fresh-water fish, 2-55.

White Butterfly, eggs, 2-171 illus.
Whitechapel, Dist. of the E. end of London, part of bor. of Stepney; has large Jewish pop.
White City, Name given to buildings erected at Shepherd's Bush, London, for Franco-British Exhibition of 1908; the first section of the B.C. television h.q. was completed in 1953 (ultimate completion of whole planned for 1963). The stadium is used for greyhound racing, boxing, and athletic events, 4-292.
White Cooch, Mt. in Dumfriesshire, Scot., 2,695 ft., 3-134.
White Ensign, Flag of Royal Navy, 3-385, 384 illus. f.
Whitefield [whitfield], George (1711-70), Brit. evangelist, founder of Calvinistic Methodists; said to have preached 13,000 sermons; made 7 voyages to America, preaching in many parts.
Whitefish, Various fresh-water fishes of genus *Coregonus*, rare in Brit.; members of salmon family.
White Friars, See Carmelite Friars.
White-fronted Goose, 4-47.
Whitehall, London thoroughfare containing important govt. offices, the Cenotaph, Horse Guards; 5-23, 5-30 illus.; banqueting house, 4-381.
Whitehall, Palace of, Former royal palace, London; now the home of the Royal United Service Museum, 5-23.
Whitehaven, Spt. and coal- and iron-mining centre in Cumberland, on Irish Sea; pop. 24,000; shipyards, iron foundries; 3-10.
Whitehead, Alfred North (1861-1947), Brit. philosopher. Professor of philosophy at Harvard Univ. from 1924. Professor of mathematics at London Univ. (1914-24). Works include: *Science and the Modern World*; *Adventures of Ideas*; 6-160.
Whitehead, Robert (1823-1905), Brit. engineer; inventor of the torpedo, 7-292.
Whitehead, William (1715-85), Brit. poet; best work in verse tales in the style of La Fontaine; poet laureate, 6-232.
Whitehorse, Cap. of Yukon Territory, Canada; a mining centre; pop. 2,594; 7-520.
White Horse, On chalk downs at Cherrhill, Wilts. 7-456 illus.
White Horse Hill, Berks, Eng. (856 ft.); chalk hill with horse carved on its face; 1-432.
White House, The. Official residence of pres. of U.S.A., Washington, 7-422, 423 illus.
White King, pigeon, 6-199 illus.
White Laburnum, See False Acacia.
White lead, Form of lead carbonate, 4-463.
White Letter Hairstreak butterfly, 2-141 illus.
Whiteman, Paul (b. 1893), Amer. jazz musician; and Gershwin, 4-357.
White Metals, Alloys of lead and iron with anti-frictional properties, 5-116.
White Mts., Group of peaks and hills of Appalachian system, U.S.A.; 1-185.
White Mustard, variety of mustard, 6-312.
White Nile, Name for that part of the Nile between its confluence with the Bahr-el-Azrek and Lake No; source, 5-440.
White Rhinoceros, 6-392.
White River, Arkansas, U.S.A. Rises in Boston Mts. near w. border; semi-circular course 400 m. long, when it divides, one channel flowing into Arkansas r. and other directly into the Mississippi.
White Russia, State of the U.S.S.R.; area 81,090 sq. m.; pop. 10,400,000; cap. Minsk, 6-470.
White Russian Language, 6-480.
White Scar Cavern, Cave in Ingleborough, Yorkshire.
White Sea, Arm of Arctic Ocean (36,000 sq. m.) extending s.w. into N. Russia between Kola and Kanin peninsulas; Baltic-White Sea canal, 6-477.

WICHITA

White Shark, 7-18 with illus.
White Squadron, In British navy, a division of the fleet until 1864, 1-20.
White Swiss Montaine, pigeon, 6-199 illus.
White Tail and the Old Stag's Lesson, Story of a young deer, 3-61.
White-tailed Deer, See Virginia Deer.
White-tailed Eagle, 3-147.
Whitethorn, See Hawthorn.
Whitethroat, A song-bird, one of the warblers, 7-418, 419 illus.; incubation of eggs, 1 460; migration, 5-204 illus. f.
White Tower, Part of the Tower of London, built by William the Conqueror, 7-301, 302 illus.; 2-204, 5-19.
Whitewash, as form of water paint, 6-38.
White Whale or Beluga, An Arctic cetacean closely related to the narwhal, pure white in colour, 12 to 18 ft. long; valuable source of food and oil.
Whithorn, Wigtownshire, Scot. Here St. Ninian brought Christianity to Scotland in 397, 7-450.
Whiting, Fish of the cod family related to the haddock.
Whitley, John Henry (1866-1935), Brit. politician; entered Parl. as Liberal in 1900; Speaker of House of Commons 1921-28; presided over a committee (1917) organizing the Whitley councils for dealing with trade disputes (in practice, survive chiefly in civil service and local govt.).
Whitlock, Brand (1869-1934), Amer. municipal reformer, diplomat, and author; minister to Belgium (1913-17); his handling of Cavell case, relief work, and difficulties due to Ger. occupation won wide notice.
Whitman, Walt (1819-92), Amer. poet, 7-449, 7-361, 4-512.
Whitney, Eli (1793-1825), American inventor, 2-518.
Whitney, Mount, Peak of the Sierra Nevada mts., California; highest in U.S.A. apart from Alaska; ht. 14,502 ft., 2-177.
Whitstable, Tn. and seaside resort of Kent, Eng., famous for its oyster-beds; pop. 17,467; 4-308.
Whitsunday or Pentecost, A feast day of the Christian Church, 7th Sunday and fiftieth day after Easter's commemorates descent of Holy Spirit on disciples (Acts ii).
Whittier, John Greenleaf (1807-92), Amer. poet, 7-361.
Whittington, Richard (d. 1423), London merchant and lord mayor, 7-449.
Whittle, Sir Frank (b. 1907), Brit. airman and inventor; applied jet propulsion to aircraft; his first jet aeroplane flew in 1941; in 1948 awarded £100,000 by govt.; 1-31 illus.
Whorl, In botany, name given to many leaves springing from one point; 4-470, 471 illus.
Whortleberry, See Bilberry.
Whyalla, Industrial tn. on Spencer's Gulf, S. Australia; rly. terminus, 145 m. N.W. of Adelaide; blast furnaces, shipyards, iron and steel works, and pipe-line; development mostly dates from 1941.
Wymper, Edward (1840-1911), Brit. mountaineer and explorer; ascended Mt. Pelvoux in 1861; the Pointe des Ecrins, one of the highest peaks in the Dauphiné Alps, in 1864; and the Matterhorn the following year. (*Serables Among the Alps*, *Chamunir and Mont Blanc*, and *Zermatt and the Matterhorn*), 1-123, 126.
Whyte-Melville, George John (1821-78), Brit. novelist; served in the Crimean War; his books deal with hunting and other country pursuits. (*Digby Grand*; *The Gladiators*; *Kalre-feld*; *Black but Comely*).
Wichita, Kansas, U.S.A., industrial city and wholesale trade centre on Arkansas r. 47 m. N. of Oklahoma border; pop. 168,279; livestock and grain market; large milk and packing plants; motor-cars, tractor trucks; 4-392.

WICHITA MTS.

Wichita Mts., U.S.A., 5-507.
Wichitas. Tribes of Plains Indians in U.S.A. Originally living in Wichita Mts. of Oklahoma; roamed N. and E. to Kansas r.
Wick. Co. tn. of Calhoun, Scotz., pop. 7,161; 2-165.
Wicked Bible. The, 1-443.
Wickerwork. See *Basketry and Wickerwork*.
Wicket. In cricket, 2-528.
Wickham, Sir Henry Alexander (1840-1928). British explorer and pioneer planter in tropics; and rubber tree, 6-464.
Wicklow, Irish Republic. Marit. co. in Louth; agric., stock-breeding, granite quarries; area 782 sq. m.; pop. 62,500; co. tn. Wicklow.
Wicklow Mountains. In co. Wicklow, Irish Repub.; highest summit Lugnaquilla, 3,039 ft.; 4-281.
Wicks. In candles, 2-210.
Widcombe-in-the-Moor. Village in Devon, Eng.; pop. about 700; fair, 3-337.
Widgeon. Name of a migrant duck (*Marca penelope*), which breeds occasionally in the N. parts of Gt. Britain; 3-133.
Widnes. Tn. of Lancs, Eng., 12 m. S.E. of Liverpool; pop. 48,795; chemicals; foundries, copper-smelting, asbestos, cement, and timber works; 4-444.
Widnes-Runcorn Transporter Bridge. Lancs, Eng., 2-83 illus.
Widor, Charles Marie (1845-1937). French organist and composer. Considered one of the greatest of church organists. Works include ten symphonies, and many suites, concertos and chamber pieces. Wrote *Technique of the Modern Orchestra*.
Widowers' Houses (1892). Play by Bernard Shaw, 7-19.
Widow Twankey. Character in pantomime; origin of name, 6-40.
Wieland [v'e'lant], Christoph Martin (1733-1813). Ger. epic poet and novelist; chief works, *Der Goldene Spiegel* (*The Golden Mirror*), *Agathon*, *Oberon*; 4-13.
Wielozka [v'yel'ch'kah]. Polish tn. 9 m. S.E. of Cracow; pop. 6,000; famous salt mines, 6-491.
Wiesbaden [v'e'sbaden]. Spa and cap. of the Land of Hesse, W. Germany, overlooking the Rhine. Has hot saline springs, sanatoria for rheumatism and bronchial disorders; pop. 218,300.
Wife of Bath. Comic character in Chaucer's *Canterbury Tales*, 2-311, 312 illus. f.
Wigan. Mfg. tn. of Lancs, Eng., 15 m. S. of Preston; pop. 84,546; collieries, iron and cotton industries; 4-444.
Wiggin, Kate Douglas (Mrs. Riggs) (1859-1923). Amer. novelist and playwright. (*Rebecca of Sunnybrook Farm*).
Wight, Isle of. Isl. off coast of Hants, Eng. for many purposes an administrative co. of itself; area 147 sq. m.; pop. 88,000; chief tn. Newport; 7-449, 450 illus.
Wightman Cup. Trophy competed for annually since 1923 by women lawn-tennis players of Gt. Britain and U.S.A. Played alternately at Forest Hills, U.S.A., and Wimbledon, Eng., 4-461.
Wigtown. Co. tn. of Wigtownshire, Scot.; pop. 1,376; 7-450.
Wigtownshire. Co. in S.W. Scot., area 487 sq. m.; pop. 31,626; co. tn. Wigtown; 7-450.
Wigwam. Tent-shaped home of Red Indians, 6-373.
Wilberforce, Samuel (1803-73). Brit. clergyman; position as Bishop of Oxford (1845-69) made difficult by Oxford Movement which he did not support, although he was a high churchman; prominent in House of Lords and as opponent of Thomas Huxley and Darwin, 3-51; facility in speaking earned nickname "Soapy Sam."
Wilberforce, William (1759-1833). Brit. philanthropist and statesman; en-

tered Parl. (1780) and took foremost part in agitation for abolition of slavery; 4-202, 7-66.
Wilcox, Ella Wheeler (1855-1919). Amer. writer of popular sentimental verse.
Wild, Frank (1874-1939). Brit. explorer; with Capt. Scott (1901-04); with Shackleton (1907-09, 1914-17); with Mawson (1911-13); second in command of the Quest (1921); (*Shackleton's Last Voyage*).
Wild, Jonathan (c. 1682-1725). Eng. criminal; blackmailer and receiver of stolen goods; hanged at Tyburn. Fielding wrote a satirical *Life*.
Wild Arum. A poisonous plant, 6-230, 3-399. See also *Arum*; *Wake-Robin*.
Wild Ass. 1-276, 275 illus.
Wild Boar. teeth, 5-102.
Wild Cat, *Felis sylvestrus*. 2-263, 262 illus.
Wild Duck or Mallard. 3-133 illus. f.
Wilde, James (b. 1892). British boxer; won outright the Lonsdale belt for flyweights; one of the greatest ever known at that weight.
Wilde, Oscar (1856-1900). Brit. (Irish) poet and playwright, leader of the "aesthetic" movement; chief plays, *Lady Windermere's Fan*, *An Ideal Husband*, *The Importance of Being Earnest*; also wrote *The Ballad of Reading Gaol*; and *The Picture of Dorian Gray* (novel); 3-291.
Wilder, Thornton (b. 1897). Amer. novelist and playwright; *The Bridge of San Luis Rey* (novel); *Our Town*; *The Skin of Our Teeth* (plays); 7-366.
Wild Goose. 4-16.
Wilding, Anthony Frederick (1883-1915). N.Z. tennis player; in 1907 won the All England plate; gained All England singles championship in 1910, 1911, 1912, 1913, 4-462.
Wild Silk, or Fussor, Silk. 7-54.
Wilhelmina (b. 1880). Queen of the Netherlands, 1890-1948, when ill-health led her to abdicate in favour of her daughter Juliana. Retired into private life as Princess of the Netherlands.
Wilhelmshaven. Spt. and tn. of W. Germany, in Land of Saxony, on North Sea coast, 41 m. N.W. of Bremen; pop. 101,000. Industries include shipbuilding, canning, making fertilizers and typewriters.
Wilhelmshat, Battle of (1758), in Seven Years' War, 7-2.
Wilkes Charles (1798-1877). Amer. naval officer and explorer; Antarctic voyages, 6-244.
Wilkes, John (1727-97). Brit. politician and journalist; entered Parl. 1757; imprisoned in the Tower 1763 for criticizing the King's speech in the *North Briton*; expelled from House of Commons for an impious libel 1764 and outlawed; M.P. for Middlesex 1768 but expelled in 1769; after being several times re-elected and rejected amid a popular outcry of "Wilkes and Liberty," became alderman for the City of London 1769 and in 1774 Lord Mayor; M.P. for Middlesex (1774-90). He remains an important figure in the history of the freedom of the British press.
Wilkes-Barre [-bar'i] Pennsylvania, U.S.A. Commercial and mfg. city 98 m. N.W. of Philadelphia, on Susquehanna r.; pop. 76,826; shipping centre for greatest anthracite coal region in U.S.A.; lace, silk, hosiery, locomotives.
Wilkie, Sir David (1785-1841). Brit. (Scot.) genre and historical painter, especially noted for scenes of Scottish village life.
Wilkins, Sir (George) Hubert (b. 1885). Australian Polar explorer, 6-246; attempted to reach N. Pole, 6-245.
Will. Written statement expressing a wish as to disposal of property after death, 7-450.
Willamette. R. in Oregon, U.S.A., formed by the union of Middle Fork and Mackenzie Fork; flows 250 m. N. to the Columbia r.; 5-532.
Willard, Frances Elizabeth (1839-98). Amer. temperance leader and educationist.

WILLOW BEAUTY

Willerden. Bor. of Middx. and S.W. suburb of London; rly. junct., mfg., foodstuffs, engineering; pop. 179,647; 5-27, 5-200.
Willett, William (1856-1915). Brit. reformer; builder of distinctive houses in Kensington; promoter (1908) of first bill for daylight saving, 3-55.
William I, the Conqueror (b. 1027; reigned 1066-87). King of Eng. 7-451; and Norm. 5-449, claim to Eng. throne and Harold II, 4-133. *Domesday Book*, 3-103; and Hereward the Wake, 4-169; and London, 5-19, 3-276 illus. f., and New Year's Day, 5-409; Norman conquest, 3-276.
William II, Rufus (b. c. 1066; reigned 1087-1100). King of Eng., 7-452.
William III (b. 1650; reigned 1689-1702). King of Gt. Brit., 7-452, 3-280, 281; "glorious revolution" of 1689, 4-310; battle of the Boyne, 2-32, 4-262; and Marlborough 5-132, death, 5-231.
William IV (b. 1765; reigned 1830-37). King of Gt. Brit., 7-452; and Buckingham Palace, 2-104.
William I (1797-1888). King of Prussia from 1861 and first emperor of Ger. from 1871, 7-453, 4-8, 1-175.
William II (1859-1941). Ger. emperor and king of Prussia, 1888-1918, 7-453, 151 illus., 4-9, and Bismarck, 1-175.
William I (1772-1814). First king of Netherlands, proclaimed king (1811) after revolt against Fr.; harsh measures provoked revolt and loss of Belgian prov. (1830) abdicated (1840).
William II (1792-1849). King of the Netherlands, succeeded in 1810, gave Netherlands constitution in 1814, and averted revolution.
William III (1817-90). King of the Netherlands, succeeded 1849; father of Queen Wilhelmina.
William I, the Silent Prince of Orange (1533-84). 7-454; and revolt of the Netherlands, 1-417; museum at Delft 3-66.
William II. Prince of Orange (1626-50). Grandson of William the Silent married Mary, princess royal of Eng., daughter of Charles I.; their son became William III of Gt. Brit.
William I, the Lion (1113-1214). King of Scot., succeeded his brother Malcolm IV in 1163; invaded Eng. in 1174; was captured and forced to do homage to Henry II.
William (d. 1120). Son of Henry I, king of Eng., drowned in the wreck of the White Ship, 4-161.
William and Mary. of Eng. See *William III*; *Mary II*.
William of Wied (b. 1876). Ger. prince, distant cousin of William II of Germany; king of Albania Feb. Sept. 1911 1-92.
William of Wykeham [w'k'am] (1241-1304). Eng. statesman and prelate Bishop of Winchester, twice Chancellor of Eng.; founded Winchester College and New College Oxford 6-17 6-503 7-457.
Williams, Emyln (b. 1905). Brit. (Welsh) playwright, actor, and producer (*Night Must Fall*; *The Corn is Green*; *The Light of Hare*), impersonated Dickens in readings from that novelist's works; 7-415.
Williams, Sir George (1821-1905). Brit. merchant, founder (1844) of Y.M.C.A.
Williams, Sir Owen (b. 1890). Brit. architect, 1-248.
Williamson Henry (b. 1897). Brit. author; works include *Tarka the Outer and Salar the Salmon*. Awarded Hawthornden Prize, 1927.
Willibrod or Willibrord, Saint (657-738). Eng. missionary to the Frisians, introduced Christianity to Netherlands.
Willis's Rooms. See *Almack's*.
Will of the Wisp, or Ignis Fatuus: at natural gas, 6-331.
Willow Tree. 7-454, 7-311, crop-pollination, 3-397.
Willow Beauty. Typical moth of the *Geometrid* group, whose caterpillar

WILLOW Calf

are of "stick" or "looper" type. Mottled brownish wings, with wavy markings. Larvae feed on willow; 4-263 illus.

Willow Calf, type of leather; origin of name, 4-469.

Willow-herb or **Reesbay**. A perennial plant, 7-455; pollen grains, 3-399 illus.; leaves, 3-400.

Willow Pattern, legend of the 7-455.

Willow Warbler. A song-bird, 7-419; eggs, 1-452 illus. f.; migration, 8-204 illus. f.

Willow Wren. Another name for the willow warbler.

Wills. Name of family of Brit. manufacturers. Henry Overton Wills (1781-1826) founded the famous tobacco business; succeeded by sons William Jay (1797-1865) and Henry Overton (1800-71) and firm became known as W. D. & H. O. Wills; in 1901 became a leading branch of the Imperial Tobacco Company.

Wills, Sir Alfred (1828-1913). Brit. mountaineer; ascent of Wetterhorn (1834), 1-126.

Will's Coffee House. Once famous literary resort in London, situated at corner of Russell St. and Bow St., Covent Garden, and named after William Orwin its founder. Favourite haunt of Dryden and Pope.

Wills-Moody, Helen (Mrs. A. Roark) (b. 1905). Amer. lawn-tennis player; seven times U.S. champion, four times champion of Fr., and champion at Wimbledon 1927-34; 4-462.

Wilmington, Delaware, U.S.A. Largest city and chief mfg. centre on Delaware r.; pop. 110,350; shipbuilding yards, machine shops; 3-66.

Wilno (Lithuania). See **Vilnius**.

Wilson, Allan B. (1894-88). Amer. inventor who made several improvements to the sewing machine, 7-10.

Wilson, Sir Henry Hughes (1804-1922). Brit. soldier, served in Boer War (1899-1902), and 1914-18, field-marshal in 1919, C.I.G.S. 1918-22; assassinated in London by two Irishmen.

Wilson, Henry Maitland Wilson, Baron (b. 1881). Brit. army commander of 2nd World War, G.O.C. 9th Army 1941-43; Supreme Allied Commander Mediterranean, 1943-44, field-marshal 1944; Baron 1946.

Wilson, John (1785-1854). Scot. author, the "Christopher North" of *Blackwood's Magazine*; 6-514.

Wilson, Richard (1714-92). Brit. painter; famous for landscapes in classical manner, esp. Wales; 3-200, 3-261 illus.

Wilson, (Thomas) Woodrow (1856-1921). 28th pres. of U.S.A., 7-455, 456 illus.; and League of Nations, 4-163.

Wilson Cloud Chamber, 4-277.

Wilton, Tn. in Wils. Eng., 21 m. N.W. of Southampton, pop. 2,857; Sir Philip Sidney, Holbein, Van Dyck, and Ben Jonson are associated with Wilton House, where Shakespeare is said to have played before James I (1603).

Wilton Carpets, 2-240, 247 illus. 253 illus. f.

Wiltshire. Inland co. of S.W. Eng.; area 1,345 sq. m.; pop. 387,379; co. tn. Salisbury, 7-456; Wiltshire bacon, 1-311; downs, 3-111.

Wimbledon, Bor. of Surrey, a residential suburb of London; pop. 58,158; supposed scene of defeat of King Ethelbert of Kent by King Ceawlin of Wessex (586); famous tennis courts, scene of All England Championships, 5-27, 4-461 illus., 7-196.

Wimshurst, James (1832-1903). Brit. eng.; static electric machine; 3-214.

Winchelsea, Tn. in Sussex, 8 m. N.E. of Hastings; one of the cinque ports; pop. 700; 3-402.

Winches, types of brakes used, 2-44.

Winchester, Co. tn. of Hants, Eng.; pop. 25,710; 7-467, 4-123; Alfred's statue, 1-103 illus.; cathedral, 1-202 illus., 8-3.

Winchester College, Winchester. Public school founded 1382 by William of Wykeham; 7-467 6-603.

Winchester Gallon, equals 0.833 of an imperial gallon (wine measure), 7-124.

Winckelmann, Johann Joachim (1717-68). Ger. writer; founder of modern art-history; exponent of classical (sk. art.) 4-13.

Wind, 7-457, 7-169; effect on climate, 2-409; cyclones, 3-16; in the two hemispheres, 5-179; monsoon, 5-218; information by radio-sound, 5-180; soil erosion, 6-507 illus.; in the stratosphere, 7-179; velocity in Antarctica, 1-164; and water waves, 7-132; and rainfall, 6-360.

Windau. See **Ventspils**.

Windermeres, Tn. in Westmorland, Eng.; pop. 6,306; 4-438.

Windermeres, Lake, on w. border of Westmorland (in s.e. Lake Dist.); largest lake in Eng., 3-218, 256 illus., 4-438; 7-145.

Wind Flower. See **Anemone**.

Windhoek. Cap. of S.W. Africa; pop. 20,600; 7-89.

Windhover. See **Kestrel**.

Wind Instruments, types of, 5-307.

Windlass. See **Nautical Terms** (Hist).

Windmill, 7-469, 460; in Montmartre, Paris, 6-81; in Netherlands, 5-370 illus., 373 illus.; on Norfolk Broads, 3-252 illus.

Window Glass, early use of, 4-30; refraction in, 4-198.

Windpipe or Trachea, 7-401.

Windrush, R. of Oxfordshire, Eng., tributary of the Thames, 6-21.

Windsor. Family name of the Brit. Royal Family, 7-460, 6-163.

Windsor, Duchess of (b. 1896). Amer.-born wife (née Bessie Wallis Warfield) of the Duke of Windsor, formerly King Edward VIII, 3-169.

Windsor, Duke of. See **Edward VIII**.

Windsor, Town in Berkshire, Eng.; pop. 10,302; famous royal castle; 7-460.

Windsor, Ontario, Canada. Industrial and riv. city on Detroit r.; pop. 120,019, 7-460, 2-197.

Windsor Castle, Windsor, Berks, Eng., 7-460, 461 illus. f.

Windward Islands. Brit. group forming s. div. of Lesser Antilles, W. Indies; a. 800 sq. m.; pop. 262,000; produces sugar, spices, cocoa, cotton, etc.

Wines, 7-461, 4-61; from the Bordeaux region, 2-17; types of French, 3-136; port, 1-90, 6-267; Italian wines, 6-390; Spanish, 7-101.

Wing, of aircraft, 4-369; of bird, 1-453; of butterflies and moths, 2-136.

Wingate, Gen. Orde Charles (1903-41). Brit. soldier. In Sudan defence force 1928-33; organized and trained Jewish volunteer force in Palestine and Transjordan (Jordan) 1946-38, and restored order in areas where oil pipe-line ran and on northern frontier; in 2nd World War raised guerrilla force to assist Allies in Abyssinian campaign; raised Chindits for guerrilla warfare behind Jap. lines in Burma, killed in aeroplane accident Mar. 1944.

Wing-Commander, in R.A.F., 6-463.

Winged Victory. Statue of Niké, Gk. goddess of victory, in the Louvre, 4-90, 5-47 illus.

Wingfield, Major Walter (1833-1912), and early form of lawn tennis (1875), 4-460.

Wingfield Scull. Sculling race which forms the English Amateur Championship. Instituted in 1830, it is rowed annually in May on the Thames, from Putney to Mortlake (4½ m.).

Winkelried [vin'kelrét], Arnold von. Swiss hero who, at battle of Sempach (1386), rushed towards the Austrians, and, gathering many of their spears into his breast, was pierced and fell dead; his act caused a break in the Austrian ranks.

Winnebagoes. Tribe of N. Amer. Indians, formerly residing in cent. Wisconsin, U.S.A.

Winnington-Ingram, Arthur Foley (1868-1946). Brit. prelate; Bishop

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of Stepney and canon of St. Paul's (1897-1901); Bishop of London (1901-30).

Winnipeg. Cap. of Manitoba prov., Canada; pop. 235,710, 7-461, 6-115.

Winnipeg, Lake, in Manitoba, Canada, 7-461, 6-114.

Winnipegosis, Lake, Manitoba, Canada, 5-114.

Winstrod, Cheshire, Eng.; rock-salt mine, 6-490 illus.

Winstow, Edward (1595-1655). One of founders of Plymouth colony; governor at intervals (1633-45).

Win'stanley, Henry (1644-1703). Eng. artist and engineer; clerk of works to Charles II.; while superintending building of first Edgystone light-house, which he designed, taken prisoner by French privateer; escaped, and completed it in 1700; swept away with lighthouse in storm of 1703.

Winston-Salem, North Carolina, U.S.A.. Second largest city of state; pop. 87,811; tobacco mfg. centre; chemicals, textiles, flour.

Wintergreen. Oil obtained from American sweet-birch bark, and used for rheumatism, 1-453, 6-506.

Winterhalter, Franz Xavier (1806-73). Ger. painter; famous for portraits of royalty, including Napoleon III, Queen Victoria and Queen Alexandra; 7-306 illus. f.

Winter Jasmine. Garden shrub, 4-354 illus.

Winter Moths. Fruit pests, 7-461, 462 illus., 2-145.

Winter Olympic Games, 5-510.

Winter Palace, Leningrad. Largest palace in Europe, became the Museum of the Revolution, 4-470.

Winter Sports, 3-311 illus., 5-402 illus.

Winter's Tale, The. Drama by Shakespeare. Written c. 1610, in his last "mellow" period; mixture of mel. drama and pastoral comedy; founded on Robert Greene's novel, *Pandosia*, or *The Triumph of Time* 1588. Amusing character is Autoly-cus, "a snapper-up of unconsidered trifles."

Wintethur (Win'tetör), Switz. Tn. 12 m. N.E. of Zürich on a Rulach; pop. 38,800; embroidery, printed cotton, machinery; vineyards.

Winthrop, John (1588-1649). Eng. colonist; first gov. of Massachusetts colony, a post he held four times.

Winthrop, John (1606-76). Son of preceding; b. in Eng., gov. of Connecticut most of period 1657-76.

Winzas. Vertical shafts of a mine, 5-215.

Wire, 7-462, 163 illus.; wire rope 6-152.

Wireless. See **Radio**.

Wireless Telegraphy. See **Telegraphy**.

Wire Nails. Variety of nails; use, and mfr., 5-313.

Wireworms. Larvae of click beetles, destructive to crops, 7-500, 1-114.

Wiring. In electricity; circuit arrangements, 3-212 with diag.

Wirral Peninsula, Ches. Eng.; dormitory towns for Liverpool, 4-525.

Wisbech, Tn. in Cambs, Eng., 15 m. W. of King's Lynn; agric. trade, brewing, pop. 17,430, 2-182.

Wisby. City and apt. of Sweden; cap. of Isl. of Gotland; mfrs. cement and wooden articles; pop. 13,600; as Hanse town, 4-129.

Wisconsin. N. cent. state of U.S.A.; area 56,154 sq. m.; pop. 3,434,775; cap. Madison, 7-464.

Wisconsin River, U.S.A.. Flows s. about 400 m. through centre of Wisconsin into Mississippi r.

Wisden's Almanack. Handbook devoted to cricket, published annually since 1864.

Wishaw, Tn. in Lanarkshire, Scot., amalgamated with Motherwell in 1920; coal mines, iron and steel works, 4-444.

Wistaria. A flowering vine of the bean family, belonging to the climbing order; it is a native of China, but can be grown in almost any part of the world, 4-347 illus.

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Wister, Owen (1880-1938). Amer. novelist (*The Virginian*; *Lady Hollimore*; *Members of the Family*; *The Pentecost of Calvary*), 7-365.

Witanagemot. Anglo-Saxon assembly of leading men in Church and state, 6-86.

Witchcraft, 7-464; witch-doctor, 5-80 illus. See also *Magie*; *Superstitions*.

Witch-hazel. A shrub of the genus *Hamamelis*; it has yellow flowers and bears edible seeds; it is a native of S. Amer. and popular in gardens in Britain. Used in medicine as astringent.

Witham. R. of Rutlandshire and Lincolnshire. Eng., flowing 75 m. to the Wash, 4-512.

Witham [wit'am]. Tn. in Essex, Eng., on main road from London to Colchester. Agric. centre, infra. of gloves and steel windows; pop. 8,508.

Wither, George (1588-1667). Eng. lyric poet ("Shepherd's Hunting"; "Songs of the Old Testament"; "Psalms of David").

Withers, of horse, 4-186 diag.

Winney. Tn. in Oxfordshire, Eng., on r. Windrush; famous for blankets and gloves; pop. 6,563, 6-22.

Wittekind (d. c. 807). Celebrated leader of the Saxons against Charlemagne; fought Franks for 8 years, but finally accepted Christianity in 785.

Wittelsbach [vit'elz'bahkh]. House of. Family which ruled Bavaria for a century as kings and for 7 centuries previous as counts or dukes, 1-387.

Wittenberg [vit'emb'urkh]. Tn. of E. Germany in Land of Saxony-Anhalt, on the Elbe; pop. 31,500; textiles, machinery; home of Luther and cradle of Reformation, 5-63; univ. incorporated with Halle in 1817; captured by Russians, April 1945, and later in Russian occupation zone.

Witwatersrand. Gold-mining dist. in Transvaal, S. Africa, 4-39, 7 91; indiv., 4-377 illus.

Wiza d. A male witch, 7-161.

Wood. A mustard-like plant yielding blue dye, 3-111.

Wodehouse, Pelham Grenville (b. 1881). Brit. humorous writer; created characters of Psmith, Jeeves, and Bertie Wooster.

Woden. See *Odin*.

Wolington, Margaret ("Peg") (1718-80). Celebrated Irish actress, heroine of Charles Reade's *Peg Wofington*.

Wöhler, Friedrich [vö'ler] (1800-82). Ger. chemist; isolated aluminum and opened up entirely new fields in chemistry by his synthesis of urea, the first organic synthesis; work on aluminum, 1-128; synthetic dyes, 3-111.

Wolf [volf], **Hugo** (1860-1903). Austrian composer. Works include: *Der Corregidor* (opera), orchestral and choral works, but Wolf's fame rests mainly upon his songs (*Lieder*), 5-305.

Wolf, a flesh-eating mammal, 7-464. Inur, 3-196

Wolf Cubs. Junior members of Boy Scout movement; uniform and organization, 2-33.

Wolfe, Charles (1791-1823). Irish clergyman and poet; "The Burial of Sir John Moore after Corunna," 5-260.

Wolfe, Humbert (1885-1910). British poet and critic (*London Sonnets*; *Clamorous*; *The Unearthly City*).

Wolfe, James (1727-80). Brit. soldier-captain of Quebec, 7-465, 2 200.

Wolff [volf], **Kaspar Friedrich** (1733-94). Ger. embryologist; lived in St. Petersburg (Leningrad) after 1786; first to advance modern "cell theory" of embryology.

Wolff-Ferrari, Erenanno (1876-1948). It. composer; his best known opera *Jesus of the Madonna* (1911), 5-515.

Wolf-fish. A large carnivorous fish of coasts of Europe and N. Amer.; great interlocking front teeth give wolfish appearance; bites savagely, when caught, 2-264.

Wolfram. See *Tungsten*.

Wolfram von Eschenbach [völ'frakh fon esh'enbahkh] (1170-1220). Ger. poet; and Lohengrin legend, 5-18; *Parzival*, 4-13.

Wolf Spider, 7 135.

Wollaston, Sir William H. (1766-1828). Brit. chemist, first discoverer of "Fraunhofer's lines," 7-127; also discovered palladium and rhodium; invented camera lucida.

Wollaston, Lake, Saskatchewan, Canada; area 786 sq. m.; drained by tributary of r. Mackenzie, 6-500.

Wolseley, Garnet Joseph Wolseley, Viscount (1833-1913). Field-marshal and commander-in-chief of Brit. army (1883-1900); leader of Red River expedition in Canada (1870), suppressing Riel's insurrection.

Wolsey, Thomas (1475-1530). Eng. cardinal and statesman, 7 466; and Henry VIII, 4-163; and Hampton Court palace, 4-124.

Wolverhampton. Mfg. tn. of Staffs, Eng., 13 m. n.w. of Birmingham; pop. 162,669; tin-plate, japanned goods, enamelled ware, various iron products, 7-141.

Wombat. See *Marsupials*.

Women and Girls; careers, 2-222; early upbringing, 2-336; education, 6-503; etiquette towards, 3-362; at London Univ., 5 33; and marriage, 5-133; Koran and, 5-88.

Women's Land Army (W.L.A.). "Body which functioned in both World Wars; organized by the min. of agriculture for farm and market garden work for a nationally fixed wage; disbanded in 1950.

Women's Royal Air Force (W.R.A.F.). Official title since 1949 of the Women's Auxiliary Air Force (W.A.A.F.), formed July 1939 from the Section of the Auxiliary Territorial Service attached to the R.A.F.; they replaced men of the R.A.F. 70 per cent. being in skilled trades; a permanent part of the R.A.F. since 1949, 6-463.

Women's Royal Army Corps (W.R.A.C.). Official title from 1949 of the Auxiliary Territorial Service (A.T.S.) of 2nd World War, which in that year became part of the regular army, 1 252.

Women's Royal Naval Service (W.R.N.S.). Women's Auxiliary service of both World Wars; estab. by Admiralty to free R.N. personnel from shore duties; in 1949 placed on a permanent basis, remaining a civilian orgn. under the Admiralty.

Women's Suffrage. The right of women to vote in affairs of govt. granted in the U.K. in 1918; age limit extended in 1928, 7-107, 6-88.

Women's Voluntary Services (W.V.S.). Brit. orgn. formed May 1938 to co-ordinate all women's voluntary associations for civil defence; also enrolled individuals; max. strength 1,215,000; in 1947 estab. on perm. basis by govt.

Wombat. A small bear-like marsupial, 5-137.

Won. See *Money* (list).

Wood, Christopher (1901-30). Brit. artist; his works, painted in a naïve and very individual style, include Cornish and Breton vil. landscapes.

Wood, Sir Evelyn (1838-1919). Brit. soldier; in Naval Brigade in the Crimea; exchanged into army (1885); served in Indian Mutiny and in Ashanti, Kafir, Zulu, and Boer wars; sirdar of Ex. army 1883-85; promoted field-marshal 1903.

Wood, Mrs. Henry (1814-87). Brit. novelist. *Dansbury House* (1860), her first novel, was followed (1861) by the enormously popular *East Lynne*; others include *The Channings*, *Mrs. Halliburton's Troubles*; founded and edited the *Argosy* magazine.

Wood, Sir Henry Joseph (1860-1944). Brit. musical composer and conductor; started his career as organist; founded Summer Promenade Concerts at Queen's Hall, London, in

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1897, and conducted them annually until his death. Knighted in 1910; O.B. in 1914.

Wood, John (c. 1705-54). Brit. architect; with his son John (d. 1782) rebuilt Bath, 1-383.

Wood; cellulose in, 2-248; as fuel, 3-186; lumbering, 5-49; for matches, 5-147; in paper making, 6-63, 70 illus.; for piano, 6-195; in rayon infra., 6-369. See also *Timber*, *Trees* and individual trees by name.

Wood Ant, jaws, 4-266 illus.

Woodbine (Woodblind). See *Honey-suckle*.

Woodchuck or *Groundhog*. A burrowing rodent, a species of marmot.

Woodcock, Katherine (d. 1658). Second wife of Milton, 5-210.

Woodcock. A game bird of the snipe family, 7 467; migration, 5-204 illus. f.; protective coloration, 8-296 with illus. f.

Woodcut, 3-292.

Wood Engraving, 3-292.

Wooden Horse, *Story of the*, 7-320.

Wooderson, Sydney C.. Brit. runner; winner of world records for 1 mile, 1 mile and 1 mile. See *Athletics* *Records*.

Wood Green. Bor. of Middx., Eng. suburb of London about 6 m. N. of the City; confectionery manufacture here; pop. 52,234.

Wood-lark. Bird resident in Brit., 4-447.

Woodlouse. A land crustacean, 7-467.

Woodpecker. Bird, 7 468; *The Story of a Baby Woodpecker*, 7 469.

Wood-pigeon. Bird, 6-197; migration, 5-204 illus. f.

Wood pulp; in paper making, 6 63, 70 illus.; in rayon infra., 6 369.

Woodruff. Plant; leaves, 4-171 illu.

Wood's Metal. Alloy of bismuth, lead, tin, cadmium; properties, 1 114, 1-175.

Wood Sorrel. Member of genus *Oxalis*, common in woods in Britain; small white flowers and acid-tasting clover-like leaves.

Woodstock. Tn. in Oxon, Eng., 8 m. s.w. of Oxford; pop. 1,713; formerly a royal residence; associated with Henry II and "Fair Rosamund"; Elizabeth I was imprisoned here by Mary I near by is Blenheim Park; 6 22.

Wood Warbler. A song bird, 7 419; migration, 5 204 illus. f.

Wood White butterfly, 2-139 illus.

Wood-wind Instruments, 7 473.

Woodworm. The larva of a beetle, 7 500.

Woody Nightshade, or *Bittersweet*. Plant of the nightshade family, 5-439, 6 236.

Wookey Hole. Cavern in Somerset, Eng., 500 ft. long; palaeolithic implements and fossil bones of reindeer, mammoth, woolly rhinoceros have been found, 2-276 illus.

Wool, 7-473; sheep shearing, 1-31; illus.; in Uruguay, 7-371 illus. See also *Sheep*; *Spinning*; *Weaving*.

Woolf, (Adeline) Virginia (1882-1941). Brit. writer. Works include: *Jacob's Room*; *Mrs. Dalloway*; *Orlando*; *The Common Reader*; *The Years*; 5-473, 3-291.

Woolen Trade, at Bradford, 2-37.

Woolley, Sir Charles Leonard (b. 1880). Brit. archaeologist. Made discoveries of the greatest value at Ur (1922-30). Publications include *Excavations of Ur of the Chaldees*, *Dugan up the Tigris*; 1-5, 7-389.

Woolley, Frank Edward (b. 1887). Eng. cricketer. Joined Kent team in 1906. Fine all-rounder, especially notable as a left-handed batsman. Retired from county cricket in 1938.

Woolly Rhinoceros. Prehistoric animal, 4-229 illus.

Woolly Thistle, 7-270 illus.

Woolner, Thomas (1825-92). Brit. sculptor and poet, one of Pre-Raphaelites; became R.A. (1874).

Woolsack. Name given to seat of Lord High Chancellor in the House of Lords—a large square bag of wool covered with red cloth, 1-77.

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Woolton, Frederick J. Marquis, Earl of (b. 1883). Brit. business man and politician; min. of food 1910-13; lord pres. of Council 1945; chairman of Conservative party 1945-53; Lord pres. of council again from 1951 to 1952

Woolwich [wool'ich]. Bor. of S.E. London, on both sides of Thames; pop. 117,820; royal arsenal; h.Q. of Royal Artillery and formerly of Royal Military Academy (amalgamated with R.M.C., Sandhurst, 1946); ferry across Thames: 5-27.

Woolworth, Frank Winfield (1852-1919). Amer. business man; developed system of stores specialising in sale of articles of small cost; Woolworth Building, in New York, built by him for head office requirements; left £9,000,000.

Woomera, A. Australia; range for testing rockets and guided missiles, 1-322.

Woonsocket, Rhode Is., U.S.A. Centre for woolen, cotton, and other mfrs., on r. Blackstone; pop. 30,200; 6-392.

Worcester [wor'ster]. Co. in. of Wores, Eng., on r. Severn, 25 m. S.W. of Birmingham; pop. 59,700; battle (1059, 2-307, 3-278; cathedral, 2-267 illus.).

Worcester, Massachusetts, U.S.A., 2nd largest city of state; pop. 201,855; mfrs. wire, envelopes, belts, and machinery: 5-115.

Worcester, H.M.S. Training ship of the Thames Nautical Training College, 5-170, 2-159.

Worcester College, Oxford Univ., 6-18.

Worcester Journal, Berrow's. Oldest surviving Brit. newspaper, founded in 1690 as *Worcester News-sheet*, and published weekly since 1701, 5-107.

Worcestershire. 29th land co. of Eng.; area 699 sq. m.; pop. 522,971; co. in. Worcester: 7-476.

Worcestershire Beacon. Highest point (1,395 ft.) in the 9-mile chain of the Malvern Hills, 7-176.

Wordsworth, Dorothy (1771-1855). Brit. writer, sister of William Wordsworth (*Journal*), 3-86.

Wordsworth, William (1770-1850). Brit. poet, 7-476, 477 illus., 3-288; and Lake Dist., 4-439; poet laureate, 6-232.

Worker Honey-bee, 1-105, 101 illus. f., 198 diag.

Workington. Tn. on Cumberland coal-field; pop. 28,882; 3-10.

Workmen's Compensation Acts. Bills by which workmen were entitled to be compensated for injury arising out of their employment superseded by National Insurance (Industrial Injuries) Act of 1917.

Works, Ministry of. Brit. govt. dept. Replaced former Office of Works in 1910, renamed Min. of Works and Planning, but reverted to original title 1913. Has charge of royal palaces and parks, public offices, and other buildings belonging to the nation.

Workshop. Tn. in Nottinghamshire, Eng.; pop. 31,000; mining and agric. centre; brewing, engineering, chemical and glass mfrs., 5-168.

World Meteorological Organization, work of, 5-179.

World War, First (1914-18), 7-478; chief events and battles, see charts, 8-532, 533; 3-316, 6-532, 4-9; aircraft, 1-35, 36 illus.; airships, 1-83; Allenby's Palestine campaign, 1-112; Amiens in 1918 campaign, 1-140; anti-aircraft artillery, 1-171; Armistice Day, 6-383; personal armour, 1-214; artillery, 1-260; balloons in, 1-356; battleships, 5-312; blimps, 1-83; bombs, 1-511; camouflage, 2-191; conscription, 1-248; Dardanelles campaign, 3-49; Kitchener's army, 4-115; Liège, 4-493; military rockets, 6-422; military transport, 6-114; Royal Flying Corps, 6-460; Woodrow Wilson and, 7-156; Zebrugge raid, 2-98. See also under names of chief battles, commanders, statesmen, and countries involved.

World War, Second (1939-45), 7-486; chief events, battles and operations, see charts, 8-533-536; 3-318; air-bombing, 1-512; aircraft, 1-35, 36 illus.; amphibious vehicles, 7-492 illus.; anti-aircraft artillery, 1-171; personal armour, 1-214; artillery, 1-260; battle of the Atlantic, 1-293; atomic bomb, 1-303, 7-198; balloons in, 1-356; battle of Britain, 2-76; Brit. fire services, 3-361; camouflage, 2-191; casualties, 7-498; use of dogs, 3-100; flying bomb, 3-103; forced labour, 7-46; gliding, 4-33; infra-red devices used, 4-261; Japanese Baka bomb, 6-123; Lease-lend, 4-465; lives saved by lifeboat, 4-191; Mulberry harbours, 5-290; naval warfare, 5-312; use of radar, 6-337; radio propaganda, 6-350; rockets, 6-423; sea-mines, 7-188; self-heating canned foods, 2-213; use of synthetic rubber, 6-466; tanks, 7-199, 7-221; V-2 rockets, 7-495.

See also under names of chief battles, operations (e.g. Dunkirk, Normandy Invasion), commanders, statesmen, countries, and areas involved.

Worm-casts, and soil, 3-151.

Worms [vornz]. City and r. port of S.W. Germany, in Land of Rhineland-Palatinate; engineering, furniture, leather, and sugar works; pop. 51,100.

Worms, Diet of (1521), condemnation of Luther, 6-376.

Worms. A variety of creatures in the lower ranks of the animal kingdom, 7-500; tube-dwelling and instinctive behaviour, 1-142, 157 illus.; in zoological classification, 1-151. See also Earthworm.

Worms Head, Wales. Promontory at the extreme W. of Glamorganshire.

Worsted. Type of cloth, 2-418, 119 illus.

Worth. Village of Alsace, Fr., scene of Fr. defeat Aug. 6, 1870, in Franco-Prussian War, 3-135.

Worthing [wɔr'θɪŋ]. Tn. and sea-side resort in Sussex, Eng., 61 m. S.W. of London; pop. 69,375.

Wotan. See Odin.

Woudhave, William (1751-1821). Brit. light-art designer, 4-193.

Wounds, antiseptic dressings, 1-177; first aid for, 3-365; penicillin used in, 1-175.

Wouwerman, Philip (1619-68). Dutch painter; painted figures and animals generally in an open-air setting, with great technical skill and industry, 5-381.

Wrangel. Isl. of Arctic Ocean 400 m. S.W. of Bering Strait; 70 m. by 35 m.

Wrath, Cape. Headland of Sutherlandshire; extreme S.W. point of Scot.; has lighthouse, 7-197.

Wreak. Small r. of Leics., Eng., tributary of the Trent, 4-176.

Wreck-buoy, 2-124 illus.

Wrekin, The. Hill in Shropshire, Eng., 1,335 ft. high.

Wren, Sir Christopher (1632-1723). Eng. architect and astronomer, 7-500, 501 illus., 1-217; churches in London, 5-21; and Robert Hooke, 4-65. See also St. Paul's Cathedral.

Wren, Percival Christopher (1873-1941). Brit. author; wrote stories of life in Fr. Foreign Legion, notably *Beau Geste* and *Beau Sabreur*.

Wren. A small bird, 7-500; and insects, 1-151, 455 illus.; song, 1-172.

Wrestling, 7-601, 502 illus.; jujitsu, 4-385.

Wrexham. Tn. in Denbighshire, Wales, 12 m. S.W. of Chester; pop. 30,962.

Wright, Frank Lloyd (b. 1869). Amer. architect, 1-218.

Wright, Orville (1871-1918) and **Wilbur** (1867-1912). Amer. pioneer aviators; designers of the first successful powered aeroplane, 1-38, 26 illus.

Wright, Philemon (1760-1839), founder of Ottawa, Canada, 6-10.

Wrist, how to find pulse, 6-301.

Writing, 7-503; Babylonian scribe, 1-335 illus.; in Braille, 1-186; Chinese script, 2-365; forms of address, 7-283; cuneiform, 1-336,

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1-119, 5-176, 6-129; Jap. writing, 4-351; early materials for, 2-12; pen, 6-111; shorthand, 7-42.

Wroclaw [vrol'and]. See Breslau.

Wrought iron, 4-293.

Wrought Nails, 5-313.

Wroxeter. Village of Shropshire, Eng., 7-15.

Wroxham. Village in Norfolk, Eng., 5-148.

Wroxham Broad. Yachting centre on Norfolk Broads, 5-147 illus.

Wryneck. Brit. bird of woodpecker family; one of earliest migrants; so called from habit of twisting head round; migration, 5-204 illus. f.

Wuchang, China. One of the three towns forming the metropolis Wuhan, 4-126.

Wuchow [wuch'ow]. China. Formerly treaty port on Sinking or West r. 125 m. W. of Canton; pop. 58,100.

Wuhan, China. City formed by three towns, Hankow, HanYang and Wuchang; pop. 875,550; 4-126.

Wundt [vund't], **Wilhelm** (1832-1920). Ger. physiologist, psychologist, and philosopher; called creator of modern experimental psychology, 6-160.

Wuppertal [vup'ertahl]. City in Land of North Rhine-Westphalia, W. Ger. formed by union (1920) of Barmen and Elberfeld; mfg. centre; pop. 363,220; 4-5.

Wurttemberg [vurtemberg]. Former state in S.W. Ger., since 1951, part of the Land of Baden-Württemberg.

Wurzburg [vurtsburg]. Ger. city in Land of Bavaria, 80 m. S.E. of Frankfurt; pop. 63,300; badly damaged during 2nd World War; machinery, spirits, scientific instruments; Univ.; 1-387.

Wy at or Wyatt, Sir Thomas (1503-42). Eng. poet and statesman, said to have been in love with Anne Boleyn introduced Somerset into Eng. from Fr.; 3-281; father of Sir Thomas Wyatt the Younger (1520-51), executed for leading Wyat's rebellion to prevent the Sp. marriage of Queen Mary I.

Wyeh Elm. Tree, 3-237.

Wycheley [wich'eh], **William** (c. 1610-1716). Eng. wif and dramatist, 3-121, 3-287.

Wychood Forest, Oxfordshire, Eng. 6-22.

Wycliffe, John (c. 1325-84). Eng. churchman and reformer, 7-505; first Eng. Bible, 1-112, 3-283 illus.; influence on John Huss, 4-211.

Wye. R. rising on Plynlimmon, Montgomeryshire, Wales; flows S.E. into Herefordshire, Eng., and turns entering the estuary of the Sever a little below the tn. of Chepstow celebrated for its beautiful scenery especially at Symonds Yat; length 130 m.; floods, 3-391 illus., 7-4 valley, 3-129 illus., 3-251 illus. 5-216, 6-353.

Wye College. Agricultural college in Kent, Eng., founded in 1894; part of London Univ., 5-33.

Wyke-upon-Hull. Anc. name of Hull, Yorks, Eng., 4-202.

Wyllie [wyl], **William Lionel** (1851-1931). Brit. artist, painter and etcher of many fine marine subjects; R.A. in 1907.

Wymondham [wimd'ham]. Tn. in Norfolk, Eng., pop. 5,500; agric. centre; brush mfrs.; 5-118.

Wyndham, Sir Charles (1811-1919). Brit. actor; his long series of successes at the Criterion Theatre, London, began in 1874, and were continued at Wyndham's Theatre and the New Theatre; his wif acted under the name of Mary Moore.

Wyoming. A mid-western state of U.S.A.; area 97,914 sq. m.; pop. 290,529; cap. Cheyenne, 7-505.

Wyss [vys], **Johann Rudolf** (1781-1839). Swiss professor and author (*The Swiss Family Robinson*), 2-336.

Wyvern. Two-legged dragon of heraldry with a serpentine forked tail, 3-111, 4-164 illus. f.

FIRST WORLD WAR 1914-1918

PRELIMINARY EVENTS

1914	<p>June 28. Archduke Ferdinand assassinated</p> <p>July 23 Austria sends ultimatum to Serbia</p> <p>July 27 Failure of Conference proposed by England owing to refusal of Germany</p> <p>July 28. Austria declares war on Serbia</p> <p>July 29 Russia mobilizes against Austria in aid of Serbia</p>	<p>July 30 Belgrade bombarded</p> <p>Aug 1 Germany declares war on Russia over mobilisation.</p> <p>Aug 2 Germany demands passage through Belgium.</p> <p>Aug 3 Germany declares war against France, Russia's ally</p> <p>Aug 4 Germans invade Belgium when passage is refused.</p> <p>Aug 4 Britain declares war on Germany to protect Belgium</p>
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	WESTERN FRONT	EASTERN FRONT	OTHER FRONTS AND EVENTS	DIPLOMATIC EVENTS
1914	<p>Sept. 6-10. German invasion of France stopped at the Marne. Entrenched line established along the Aisne, north to Belgian coast, and south-east to Switzerland</p> <p>Oct-Nov Germans fail to break line in Flanders (Ypres)</p>	<p>Aug 26-31 Hindenburg stops Russian offensive at Masurian Lakes (Battle of Tannenberg).</p> <p>Aug-May 1916 Russians invade Galicia and capture Carpathian passes</p> <p>Nov-Dec Three German attacks on Warsaw beaten off</p>	<p>Aug 25 Naval battle in Heligoland Bight, German navy bottled up.</p> <p>Aug Sept Germany loses overseas colonies—in Africa to the British, Pacific Islands to British and Japanese</p> <p>Aug Sept Austrian invasions of Serbia fail</p> <p>Nov 7 Japanese take Tsingtao (Kiaochow) in Shantung China, from Germans</p> <p>Nov 10 German cruiser Emden destroyed at Coos Islands</p> <p>Dec 8 British naval victory off Falklands avenges German victory of Coronel</p>	<p>Aug 7 Montenegro joins the Allies</p> <p>Aug 23 Japan joins the Allies</p> <p>Oct 29 Turkey openly joins Germany and Austria</p>
1915	<p>Repeated attempts to break the line by Allies at Neuve-Chapelle (Mar-10), (Germans at Ypres (Apr-May), Allies above Arras (May-June), Germans in the Argonne (July), Allies in Champagne and Artois (Sept-Oct)</p>	<p>May-Sept "Mackensen's drive" expels Russians from Galicia</p> <p>June Oct Austro-German drive into Russian Poland, capture of Warsaw (Aug 5), Brest Litovsk (Aug 25); Vilna (Sept. 18)</p>	<p>Feb-Dec Anglo French attacks on the Dardanelles fail</p> <p>May 7 Lusitania sunk; 1,198 lives lost</p> <p>July Germans South-West Africa conquered by General Botha</p> <p>Oct-Dec Austro-German army conquers Serbia, Allied expedition from Salonika defeated at Vardar (Dec 5-12)</p> <p>Dec Jan Gallipoli expedition abandoned by Allies</p>	<p>May 23 Italy declares war on Austria</p> <p>Oct 15 Bulgaria joins Central Powers</p>
1916	<p>Feb-July Terrific German attacks on Verdun fail ("They shall not pass")</p> <p>July-Nov Allied gains in Battle of the Somme</p>	<p>June-Aug Russian counter attack in Galicia; penetrates to Halicz</p> <p>Aug-Dec Rumania invades Transylvania, terrific counter-attack of German Austrian-Bulgarian armies (Mackensen); Bucharest taken and Rumania crushed</p>	<p>Jan-Feb Austro-Bulgarian invasion of Montenegro and Albania</p> <p>Jan July Russian drive through the Caucasus</p> <p>Apr 21 Capture of British forces at Kut-el-Amara</p> <p>May June Austrian offensive against Italy</p> <p>May 31 June 1 Naval battle of Jutland, German fleet withdraws</p> <p>Aug 4 Italian counter-offensive against Germans in the Piave</p>	<p>May Portugal joins the Allies</p> <p>Aug 27 Rumania joins the Allies</p> <p>Dec 6 Lloyd George displaces Asquith as British prime minister</p>
1917	<p>Mar Withdrawal of Germans to "Hindenburg line", wasting off country on 50 mile front</p> <p>Apr-Dec Repeated Allied attempts to break line at Arras (Apr-June)</p> <p>Vimy Ridge taken (Apr 9-12) attacks along Aisne (Apr-Nov), in Flanders (July-Dec), at Cambrai (Nov-Dec)</p>	<p>Mar 15 Russian revolution destroys effectiveness of Russian army</p> <p>July Russian offensive on east front fails</p> <p>Sept 3 Riga captured by Germans</p>	<p>Feb-Oct British Mesopotamian campaign; Kut-el-Amara recaptured (Feb 24) Baghdad (Mar 11)</p> <p>Oct-Dec Italian disaster at Caporetto driven back from Isonzo to Piave</p> <p>Oct-Dec Allenby's Palestine campaign; fall of Jerusalem (Dec 9)</p>	<p>Jan 31 Germany announces unrestricted submarine warfare</p> <p>Feb 3 United States severs diplomatic relations with Germany</p> <p>Mar 15 Tsar of Russia dethroned, Kerensky establishes moderate government</p> <p>Apr 6 United States enters the war, Panama, Cuba, Liberia, Brazil follow, nine Central and South American States sever relations with Germany but do not declare war</p> <p>June 12 King Constantine deposed and Greece joins Allies</p> <p>Aug 14 China joins the Allies</p> <p>Nov 4 Bolsheviks control government in Russia</p>
1918	<p>Mar-July Great drive of Germans fails, Plebiscite offensive launched (Mar 21), Iys River (Apr 9), Aisne and Meuse (May 27) Oise (June 9) second Battle of the Marne (July 15)</p> <p>July 18 Allied counter-offensive begun, Battle of Amiens (Aug 8) Australians take St. Mihiel (Sept 12), Germans lose Iys salient (Aug-Sept)</p> <p>• American advances along Argonne-Meuse front (Sept-Nov) "Hindenburg line" broken (Oct)</p> <p>• German right flank turned in Belgium (Sept-Nov) Germans decide to surrender</p>	<p>Feb-Mar Germany transports forces from Russian front for use on western front.</p> <p>Sept Allies defeat Bulgarian armies in Macedonia and Bulgaria sues for peace</p> <p>Oct-Nov Montenegro and Serbia recovered by Allies.</p>	<p>Aug 6 Allies seize Archangel, Russia, and establish a northern front</p> <p>Aug American-Japanese expedition to Siberia</p> <p>Sept 19-Oct 25 Allenby clears Palestine of Turks, cuts Baghdad railway Turkey sues for peace</p> <p>Oct 24-25 New Italian attack drives Austrians back on line from Alps to Adriatic Austria sues for peace (Oct 29)</p>	<p>Jan 5 Lloyd George announces war aims of the Allies</p> <p>Jan 8 "President Wilson states his 14 points" for peace</p> <p>Jan-Mar Break up of Russia, Finland, Lithuania, Ukraine, Crimea, Armenia, Siberia set up independent governments.</p> <p>Mar 4 Soviet Russia accepts humiliating peace of Brest-Litovsk with Germany</p> <p>June 30-Sept Allies recognize independence of Czechoslovakia</p> <p>Sept 29 Bulgaria signs armistice.</p> <p>Oct 5 Germany appeals to President Wilson for restoration of peace</p> <p>Oct 31 Turkey signs armistice</p> <p>Oct 31 Hungarian independence declared</p> <p>Nov 3 Austria signs armistice.</p> <p>Nov 9 Polish republic announced</p> <p>Nov 9 German Emperor flees to Holland signs abdication (Nov 29)</p> <p>Nov 11 Armistice signed by Germany</p> <p>Nov 12 Emperor Charles abdicates Austrian throne</p> <p>Dec 1 Yugoslav convention proclaims Kingdom of Serbs, Croats, and Slovenes</p>

NOTABLE BATTLES OF THE FIRST WORLD WAR

1914 Aug 4-16	..	Battle of Liège, a fortress near the Belgian frontier. The determined stand of the Belgians upset the enemy's programme and made the German army ten days late in reaching the French frontier.
Aug 21-23	..	Battle of Mons-Charleroi, in Belgium. The combined forces of the British and French were defeated by the Germans, whose path into France was now open.
Aug 26-Sept. 1		Battle of Tannenberg in East Prussia, called by the Germans the "Blood in the East". Hindenburg here crushed one of the Russian armies that had invaded East Prussia.
Sept 6-10	..	First Battle of the Marne. The French army stopped the German advance within sight of Paris and turned it into a German retreat.
Sept 6-15	..	First Battle of the Masurian Lakes, in East Prussia, resulted in the crushing of a second Russian army by the Germans.
Sept 12-27	..	Battle of the Aisne began the trench warfare, which lasted until 1918.
Oct. 16-30		Battle of the Yser, in Belgium. The Belgians halted the German advance by cutting the dykes.
Oct 22-Nov 17		First Battle of Ypres (a city in Belgium), or the First Battle of Flanders. The Germans failed in their attempt to pierce the lines and reach Calais.
Nov. March 22 (1915)		Siege of Przemyśl, a strong Austrian fortress in eastern Galicia. 120,000 Austrians were made prisoners when hunger forced Przemyśl to surrender to the Russians. The fortress was retaken by the Austrians and Germans on June 2, 1915.
1915 Jan 24	..	Battle of Dogger Bank, a naval engagement in the North Sea between battle cruiser squadrons of the British and Germans. The German vessels finally retired to the mine-strewn German waters.
Feb 4-12		Second Battle of the Masurian Lakes ended in disaster for the Russians.
March 10-12	..	Battle of Neuve-Chapelle, a little village in northern France, near Lille. The British captured a few miles of territory at terrific cost.
Apr 22-26	..	Second Battle of Ypres, or the Second Battle of Flanders. The Germans for the first time used poison gas (chlorine) released from pipes and bombs, and gained two miles on a five mile front.
Apr 26-Jan 8 (1916)		Invasion of Gallipoli, the peninsula between the Dardanelles and the Aegean Sea. After many months the British forces made up largely of Dominion troops (Anzacs), and the French army were withdrawn with nothing accomplished.
May 2	..	Battle of Dunajec River, in western Galicia, Austria. Austrian and German troops forced back the Russian line, taking many prisoners. This was the beginning of the drive which expelled the Russians from Galicia and conquered Russian Poland (July 12-Sept. 14).
Sept 25-Oct	..	Battle of Champagne, a desperate offensive of the French, resulted in some advance and many prisoners, but failed to break the German lines.
1916 Feb 21-Dec	..	Battle of Verdun, a fortified city in eastern France. The German Crown Prince sacrificed 500,000 men in the vain attempt to take the city.
May 31-June 1		Battle of Jutland, in the North Sea off the Danish coast. The losses on both sides were heavy but the British remained in control of the sea.
July 1-Nov 18	..	First Battle of the Somme, in northern France. The French and British attacked on a 20 mile front making slight gains in ground at the expense of enormous losses on both sides.
1917 July-Nov	..	Third Battle of Ypres, or Third Battle of Flanders (Passchendaele Ridge) was a slight gain for the British over the Germans. Fought in mud, which rendered tanks useless.
Oct-Nov	..	Battle of Caporetto. The Austrians began a counter-offensive against the Italians by this surprise attack which resulted in a rout. The Austrians took 200,000 prisoners.
Nov 20-Dec 13		Battle of Cambrai, a city of northern France on the River Scheldt, was begun by British tanks without any artillery preparation. The gains that were made at first were later lost.
1918 March 21-Apr 21		Second Battle of the Somme, or Battle of Picardy, on the west front from La Fère to Ypres and beyond began the German offensive in 1918.
May 27-June		Third Battle of the Aisne, a second success for the Germans. When within about 40 miles of Paris however they were stopped by the French and the Americans at Château Thierry.
July 16-18	..	Second Battle of the Marne resulted in some gains by the Germans but their plans were suddenly upset by the counter-offensive of the Allied troops under Foch.
Aug 8-Sept	..	Battle of Amiens, a great gain for the British, French, Belgians and Americans. The operations spread until the Germans were pushed back beyond the Hindenburg Line.
Sept 12-13	..	Battle of St. Mihiel, the first battle in which the Americans acted independently. The salient which had been held by the Germans since 1914 was wiped out.
Sept 19-22	..	Battle of Samaria resulted in the annihilation of the Turkish troops by the British and Arabs.
Oct. 27-Nov 3		Battle of the Piave removed Austria from the war and led her to ask for peace.

SECOND WORLD WAR · 1939-1945

PRELIMINARY EVENTS

1931 Oct.-Nov	Japan occupied Manchuria	1937 July 7	'China Incident' began	Apr. 7	France adhered to Anti-Comintern Pact. Italy invaded Albania.
1933 Jan 30	Hitler appointed Chancellor of German Reich	Nov 6	Italy joined Anti-Comintern		
1935 March 16	Conscription re-introduced in Germany	1938 Mar 11	Hitler annexed Austria	28	Germany denounced 1934 Anglo-German Naval Agreement.
1935 March 16	Conscription re-introduced in Germany	Sept. 30	Czechoslovakia dismembered by Munich Agreement	Aug 23	Germany and USSR signed Pact of Non-Aggression.
1936 Mar 7	Hitler reoccupied Rhineland	1939 March 16	Hitler occupied Czechoslovakia	24	Gt. Britain and Poland signed Pact of Mutual Assistance.
May 9	Abyssinia annexed by Italy	March 22	Hitler annexed Memel	Sept. 1	Germany invaded Poland.
July 18	Civil war broke out in Spain	31	Spanish Civil War ended, Gen Franco Dictator of Spain.	3	Britain and France declared war on Germany.
Oct 26	Rome-Berlin Axis formed	Apr 6	Chamberlain promised British support to Poland		
Nov 25	Anti-Comintern Pact between Germany and Japan				

SECOND WORLD WAR,

	WESTERN EUROPE	N AFRICA AND ITALY	RUSSO-GERMAN CAMPAIGNS
1939	Sept 1-28 Ger and Russ invasion of Poland Sept 3 U.K. and France declare war on Germany Nov 30 Russ invasion of Finland		
1940	Mar 12 Surrender of Finland to Russ April-June Ger invasion of Denmark, Norway, Netherlands, Belgium, Luxembourg and France. B.E.F. evacuated at Dunkirk June 10 Italy declares war on Britain and France July-Oct Battle of Britain Oct 28 Italian invasion of Greece	Apr 8-11 Italians invade Kenya, Sudan, British Somaliland and Egypt Dec 1-11 British under Wavell advance in Egypt and into Libya	
1941	Mar 1 British raid on Lofoten Is. April German invasion and defeat of Yugoslavia and Greece June 1-17 Battle of Britain Sept 8 Allied raid on Svalbard Dec 8 U.K. (and U.S.A.) declare war on Japan Dec 11 Germany and Italy declare war on U.S.A.	Jan 17-18 Italians withdraw from Libya Kenyatta and Sultan Italian Somaliland captured by British Mar-Apr British Somaliland liberated June 1-4 captured in Abyssinia after 1 year of Italian counter-offensive in Italy July 1-11 British withdraw from Tobruk besieged (Apr 11-Nov 20) Nov-Dec S.E. and British offensive in Libya Benghazi taken Dec 24 With surrender of Guderian 19 Italians Abyssinia freed (Nov 27)	June 22 German invasion of Russia. June-Dec German victories force Russ withdrawal from Baltic States and Poland (June) Smolensk (Aug 12) Kiev (Sept 21) Vyazma (Oct 13) Orel (Oct 16) Kharkov (Oct 21) Dec 10 Russ counter-offensive begins
1942	Brit commando raids on Bruneval (Feb 27) St Nazaire (Mar 28) Boulogne (Apr 28) Dieppe (Aug 1) Sept 25 Raid by R.A.F. Mosquito bombers on Gestapo HQ Oslo	May-July Second German offensive in Libya Tobruk captured (June 1) Alamein reached (July 1) Oct 23-Nov 4 British victory of Alamein and opening of third British thrust in Egypt and into Libya Nov 8 Allied landings in N.W. Africa	First fighting in southern half of front, with retreats to both sides (Russian at Stalingrad) Feb 24 German at Sevastopol July 3 At Sept German advance in Caucasus and to Stalingrad Sept 23 Decisive battle of Stalingrad opens
1943		Oct 23-Nov 4 British victory of Alamein and opening of third British thrust in Egypt and into Libya Nov 8 Allied landings in N.W. Africa British 8th Army from east and Allied forces from west advance toward each other and meet in Tunisia Apr 12 Surrender of all Axis forces in N. Africa July-Aug Allied capture of Sicily Sept 3 Allied landings in Italy unconditional surrender of Italy, which on Oct 13 declares war on Germany	Dec Russian offensives across Don and in Caucasus The tide turns with Russian victories at Leningrad (siege ended Jan 19) and Stalingrad (surrender Jan 27) Last German troops captured Feb 2 Feb Russian advance capturing Kursk (Feb 8) and Rostov (Feb 11) Mar-Aug Great battles around Kharkov and on Orel, Karkov, Belgorod front ends in victories for Russ Sept Russian victorious advance begins German withdrawal from Caucasus Oct 3 liberation of Smolensk (Sept 25) and Kiev (Nov 6)
1944	June 6 Allied invasion of Normandy (D-Day) July-Aug Gigantic battles at Caen and Falaise Following Ger defeat there, Allies spread through France (Paris liberated Aug 25) and Belgium (Brussels liberated Sept 3) and enter Germany (Aachen taken Oct 20) Sept 17-25 Battle for Rhine crossings Arnhem airborne operation Oct 1 Liberation of Greece begun Dec-Feb 1945 Desperate German counter-offensive in Ardennes defeated	Dogged fighting all the way up Italy June 4 Rome occupied by Allies Aug 11 Florence occupied by Allies	Jan-Aug Russian advance continues on whole length of front Liberation of Leningrad (Jan 27) Odessa (Apr 1) Sevastopol (May 9) Minsk (July 1) Lublin (July 24) and Bratislava (July 28) Aug-Dec Advance carries Russian into Lithuania (Kovno taken Aug 1) Rumania (surrender Aug 24) Latvia (Lauka taken Aug 25) Bulgaria (11 days war ends finally Sept 5) Bulgaria (cease fire Sept 19) Yugoslavia (Belgrade taken Oct 20) Estonia (entered Oct 23) Norway (Oct 25) and Hungary (Budapest encircled Dec 26)
1945	Feb 22 Liberation of Luxembourg Mar Offensive in Ger carries Allies across Rhine in force Apr Allied divisions in central Germany Ruhr and S. Ger (Leipzig taken Apr 1) Stuttgart Apr 22 Allied and Russian forces meet at Torgau Apr 25 Munich taken Apr 30 May 2 British forces reach Baltic at Wismar Hamburg taken May 3 May 4 Surrender of all German forces in N.W. Ger, Denmark and Netherlands May 7 Unconditional surrender of all German forces; ratified in Berlin May 9	Apr 21 Bologna occupied by Allies Apr 27 Genoa entered by Allies Apr 29 Unconditional surrender of all German forces in Italy May 4 U.S. forces enter Italy from Austria May 6 Allied 5th Army enters Austria from Italy	Jan 17 Warsaw liberated Jan-Mar Russian advances in Prussia Hungary (Budapest falls Feb 13) and Poland (Danzig taken Mar 30) Apr Russians capture Koenigsberg (9th), Vienna (13th), enter Berlin (23rd), and meet Allied forces from West at Torgau (25th) May 2 Surrender of Berlin May 10 Prague entered by Russian and Americans

1939-45 (contd.)

THE FAR EAST	OTHER ACTIONS	GENERAL EVENTS
	Sept 4 S.S. <i>Athena</i> sunk Oct 14 H.M.S. <i>Royal Oak</i> sunk in Scapa Flow Nov 21 S.S. <i>Rawalpindi</i> sunk Dec 13 Battle of River Plate, <i>Craf</i> <i>Spec</i> sent led Dec 17	Oct 27 U.S. Senate rep. deems export embargo Nov 8 Hitler escapes Munich for hill bomb
	Feb 16 R.N. rescue <i>Altmark</i> prisoners May 10 British landing in Iceland July 1 Germans occupy Channel Is. July 1 British action against French warships at Oran Sept 7 London "blitz" opens Nov 5 H.M.S. <i>Tervis Bay</i> sunk Nov 11 Allied sea-air victory of Taranto Nov 14 Devastation of Coventry by German bombing Dec 29-30 Fire raid on City of London	Jan 8 Butter sugar and bacon rationed in U.K. Mar 21 Reynaud premier of France May 11 Churchill U.K. prime minister May 14 Local Defence Volunteers (later Home Guard) formed June 17 Petain premier of France July 26 Japan occupies French Indo-China Sept 1 U.K. leases Atlantic bases to U.S.A. In exchange for 50 old destroyers Sept 23 George Cross and Medal in tituted Sept 27 Japan signs 10-year pact with Germany and Italy Oct 21 Purchase tax instituted in U.K.
Dec Japanese attacks on Pearl Harbour, Hong Kong, Shanghai, Guam, Wake I (7th), Invasion of Siam, Malaya (8th), Philippines (10th) and N. Borneo (17th) Dec 10 Loss of H.M.S. <i>Prince of Wales</i> and <i>Rapids</i> Dec 25 Surrender of Hong Kong	Mar 28 Battle of Cape Matapan May 21 H.M.S. <i>Hood</i> sunk May 27 <i>Bismarck</i> sunk July 12 British and Free French occupy Syria Aug 25 British and Russians enter Persia Nov 14 H.M.S. <i>Ark Royal</i> sunk	Mar 11 Lease-Lend Act passed by U.S. Congress Mar 27 Coup d'etat in Yugoslavia King Peter takes over govt June 1 Clothes rationing in U.K. Aug 14 Atlantic Charter drawn up by Churchill and Roosevelt Sept 16 Abdication of pro-German Shah of Persia Oct 20 Removal of Soviet govt. to Khabarovsk reported
Jan 23-25 Battle of Makassar Straits Feb 15 Fall of Singapore Feb 27 Mar 1 Battle of Java Sea Japan landings in Java Feb 28 New Guinea March 8 Mar-May Japanese advance in Burma and Brit. Vic. etc. May 4-9 Battle of Coral Sea - first sea battle prizes toward Australia Jan 6 Battle of Midway I. Japanese landings in Northern Is. June 15 and 1 Sept 10 Japanese withdrawal in Burma All Japan but for Japanese victory in Burma under British Feb 10 and 11 in Philippines Feb 15 Churchill's position in London Mar 11 Little Bismarck Feb 1 Battle of Kely Gulf All Japan but for Japanese victory in Burma under British Feb 10 and 11 in Philippines Feb 15 Churchill's position in London Mar 11 Little Bismarck Feb 1 Battle of Kely Gulf	Feb 12 Escape of "Scharnhorst," "Gneisenau," and "Prinz Eugen" up English Channel Feb 19 Japanese bomb Darwin, Australia Apr 18 Tokyo bombed by U.S. carrier force planes May-Nov British occupation of Malaya May 30 First 1,000-bomber Allied raid on Cologne June 10 Hitler Czechoslovakia seized to the ground by Germans Nov 27 Fleet scuttled at London	Feb 19 Trial of prominent Frenchmen by Vichy govt. against abandoned June 1 Apr 1 Malta awarded Gen. Croc May 26 Anglo-Soviet treaty signed July 27 Sweets rationed in U.K. Aug 25 Duke of Kent killed in air crash Nov 11 Germany occupies Vichy France Nov 18 David made virtual dictator of France Dec 21 Dublin Vichy in occupation Jan 14-24 Casablanca conference May 22 Communist display July 2 Mufti resigns July 26 Italian 14 party B. J. I. Aug 17-25 1st Quebec Conference Oct 12 Portugal and Axis in Axis-Allies Nov 9 44 nation war treaty N.R.P. Nov 22-26 Cairo conference Nov 28 Dec 1 Teheran conference Jan 11 Game lost by Axis
Jan 1-10 Allied landings in Marshall, Admiralty, and Mariana Is. and Netherlands New Guinea Mar 17 Japanese invade Assam Kohima fell (Feb 24-Apr 24) Mar 24 Wingate leader of Chindits killed in air crash June British counter-offensive in Assam and Burma July-Nov Allied flight hopping continues in Marianas, Moluccas, Palau Is. Aug 20 Japanese cleared from Assam Oct 20 Americans land on Leyte, Philippines Oct 23-27 Battle of Leyte Gulf Jan-June British advance in Burma Mandalay retaken (Mar 20) Rangoon (May 3) U.S. in Philippines retake Manila (Feb 24) Feb 10 U.S. landing on Iwojima Apr 1 U.S. landing on Okinawa Aug 6 Atomic bomb on Hiroshima Aug 8 Russia declares war on Japan Aug 9 Atomic bomb on Nagasaki Aug 14 Unconditional surrender of Japan, main instrument signed in Tokyo Bay Sept 2	June 13 First flying-bomb on England Sept 4 Flying bomb launched, set on fire in Pacific cut off from their base by Allied advance Sept 8 First rocket bomb on England Nov 12 <i>Luft</i> sn. in Hiroshima Nov 24 Tokyo bombed by U.S. Superfortresses from Sulpan, Mariana Is. Jan 2 Iodo road completed Mar 27 Last rocket bomb on England Apr 9 <i>Admiral Scheer</i> sunk by bombs at Kiel	Oct 11 Death of J. M. Roosevelt Nov 1 Home Guard stands down Feb 4-12 Yalta (Crimea) conference Apr 12 Death of President Roosevelt Apr 23 Mussolini shot by Italian Partisans Apr 30 Death of Hitler May 8 V-E day July 5 General election in U.K., Labour govt. formed July 26 July 17-Aug 1 Potsdam conference Aug 15 V-J day






NOTABLE BATTLES OF THE SECOND WORLD WAR






1939 Sept. 1-28	Battle of Poland and 1st Battle of Warsaw. Germans attacked Poland, took Warsaw on the 28th, partitioned the country with Soviet Union, 28th.
1940 June 5-22	Battle of France. Germans, having turned the Maginot Line, swept across N. France to Paris.
June-Nov. 1942	Battle of Malta. First attacked by Italian aircraft, June 11, 1940; Luftwaffe joined in attacks, Jan. 1941. Allied reconquest of N. Africa freed Malta from danger of isolation and invasion.
July 10-Oct. 31	Battle of Britain. Luftwaffe, attempting to prepare for German invasion of Britain, met decisive defeat by R.A.F.
Oct. 28-Nov. 21	1st Battle of Greece. Italian invaders of Greece defeated by Greeks with slight British aid.
1941 March 28	Battle of Cape Matapan. British naval victory over Italians in Greek waters.
Jan. 18-Nov. 27	Battle of Abyssinia. First Axis-enslaved country freed; by British force.
April 6-27	2nd Battle of Greece. Germans defeated Greeks, and small British and Imperial force.
May-19 June 1	Battle of Crete. British, Imperial, and Greek forces defeated by first successful use of airborne troops.
Sept. 2-Jan. 27, 1944	Siege of Leningrad. Leningrad was cut off from outside help except across L. Ladoza until Jan. 18, 1943, complete relief only on Jan. 27, 1944.
Oct. 6-Dec. 6	Siege of Moscow. State of siege (proclaimed Oct. 19) lifted by Russian offensive beginning Dec. 6.
Nov. 1-July 3, 1942	Siege of Sevastopol. Russians held city for eight months; recaptured it in three days (May 7-9, 1944).
1942 Feb. 8-15	Fall of Singapore. "Greatest disaster to British arms which our history records."—Winston Churchill.
Feb. 27-March 1	Battle of Java Sea. British, Dutch, U.S., and Australian force of 12 ships wiped out.
May 4-9	Battle of Coral Sea. Japanese fleet approaching Solomons defeated with loss of 7 major warships.
June 4-6	Battle of Midway Island. Japanese air and naval attack; 15 enemy warships sunk or damaged.
Aug. 7-Feb. 10, 1943	Battle of Guadalcanal. First reconquest (by U.S. forces) of island seized by the Japanese.
Sept. 16-Feb. 2, 1943	Battle of Stalingrad. Russian tenacity held the Germans west of the Volga, and this marked the turning point of the war in E. Europe.
Oct. 23-Nov. 4	Battle of Alamein. Beginning of 8th Army's drive across N. Africa, turning point of war in west.
1943 March 2-4	Battle of the Bismarck Sea. Japanese convoy of 10 warships, 12 transports destroyed by air bombing; "a naval victory won by air power directed by an army general" (MacArthur).
March 20-26	Battle of Marth. Capture of Marth Lago, last major conflict in N. Africa.
July 10-Aug. 17	Battle of Sicily. Sicily fell to the Allies in 48 days.
Nov. 20-23	Battle of Betio Atoll, Tarawa. U.S. Marines lost 1,020 killed, 2,557 wounded on this small atoll in Gilberts.
1944 Feb. 2-May 18	Battle of Cassino. Picked German troops on Monte Cassino, lofty strongpoint covering only possible road to Rome and kingdom of so-called Gustav Line, offered stubborn resistance to Allied advance.
May 17-Aug. 4	Siege of Myitkyina. American and Chinese captured Myitkyina airfields (Burma) on May 17; town, Aug. 4.
June 14-19	Battle of the Philippine Sea. Japanese air attack (19th) on American fleet off Saipan beaten off with loss of 333 enemy machines, 21 American, slight damage to 3 U.S. ships; Japanese fleet driven to retreat by U.S. air attack (19th); 7 enemy ships sunk.
Aug. 1-Oct. 3	2nd Battle of Warsaw. Polish Home Army rose when Soviet artillery could be heard at Praga; but Germans frustrated Soviet advance, and Poles were totally defeated.
Aug. 19-22	Battle of "Falaise Gap." German 7th Army encircled and destroyed by British, Canadian, U.S., Polish, and French forces, first decisive Allied victory on reopened west front.
Sept. 2-21	Battle of Rimini. Victory in Italy in 1944 became impossible owing to stand by Germans at Rimini.
Sept. 17-25	Battle of Arnhem. British 1st Airborne Division, 10,000 strong, stood for 9 days and 8 nights without aid in an effort to hold a bridgehead across the Lower Rhine.
Sept. 21-Nov. 9	Battle of the Scheldt. Cleared the Scheldt estuary (thru Antwerp, essential for invasion of Germany).
Oct. 16-20	Battle of Aachen. First large German town to fall to the Allies.
Oct. 20-Dec. 20	Battle of Leyte. Americans surprised Japanese by landing first on this central island of the Philippines. Its capture cut in two enemy defence forces in those islands.
Oct. 23-27	Battle of Leyte Gulf. Most important naval battle of war; U.S. 3rd and 7th Fleets virtually destroyed Japanese Navy; 24 ships (including 2 battleships) sunk, some 30 others damaged.
Dec. 16-Feb. 5, 1945	Battle of the Ardennes. Last big effort of Germans in the west, who tried to break the Allied line between the U.S. 1st and 3rd Armies. Enemy salient eliminated Jan. 27, 1945.
Dec. 26-Feb. 13, 1945	Battle of Budapest. Encircled on Dec. 26, 1944, was defended by the Germans street by street.
1945 Feb. 10-Mar. 16	Battle of Iwojima. In heavy fighting for this important base in Volcano Islands there were 19,038 U.S. casualties; 21,000 Japanese casualties, mostly dead. First part of Japanese empire invaded.
April 1-June 21	Battle of Okinawa. Fierce defence of this island, first spot of Japan proper to be invaded, cost Japanese nearly 100,000 dead, U.S. losses, over 10,000 killed and missing, 34,000 wounded.
April 4-20	Battle of the Ruhr. U.S. 9th Army and 12th and 6th Army Groups encircled German Army Group B; 21 enemy divisions eliminated (317,000 prisoners).
April 23-May 2	Battle of Berlin. Russians cleared the city only after severe fighting through its streets.
July 14-Aug. 14	Battle of Japan. Intensive bombardment of Honshu by U.S. and British fleets and planes.

PEACE TREATIES OF THE SECOND WORLD WAR

Bulgaria. Signed Feb. 10, 1947, ratified Aug. 25. S. Dobruja retained (ceded by Rumania in 1940). Reparations by Bulgaria to Yugoslavia (25 million dollars) and Greece (45 million dollars), to be paid in commodities over 8 years.	Dalmatian coast, and Pelagosa Isl.; to Greece, of Dodecanese. Agrees to estab. of free territory of Trieste. Renounces all rights to African colonies, Ethiopia, and Albania. Reparations to U.S.S.R. (100 million dollars), Yugoslavia (125 million dollars), Greece (105 million dollars), Ethiopia (25 million dollars) and Albania (5 million dollars) in commodities, etc. over 7 years.
Finland. Signed Feb. 10, 1947, ratified April 18. Cession to U.S.S.R. of Karelian Isthmus, Viborg, and territory W. of L. Ladoga, as provided in 1940 peace treaty, also of Petsamo 50-year lease to U.S.S.R. of Porkkala-Udd area, S.W. of Helsinki, as naval base. Reparations to U.S.S.R. of 300 million dollars in commodities over 8 years.	Japan. Signed Sept. 8, 1951; effective April 28, 1952. Independence of Korea recognized; claims to Formosa, Kurile Is., S. Sakhalin, and to islands formerly held under mandate renounced; placing of Ryukyu, Bonin, Volcano, and Marcus Is. under trusteeship agreed to; payment of reparations for damage caused accepted in principle.
Hungary. Signed Feb. 10, 1947, ratified June 27. Return to 1940 frontiers (Transylvania restored to Rumania and Banat to Yugoslavia, Ruthenia ceded to U.S.S.R.); small area (the Bratislava bridgehead) ceded to Czechoslovakia. Reparations to U.S.S.R. (200 million dollars) and Czechoslovakia and Yugoslavia (100 million dollars) in commodities over 8 years.	Rumania. Signed Feb. 10, 1947, ratified Aug. 23. Cession of Bessarabia and N. Bukovina to U.S.S.R., and of S. Dobruja to Bulgaria, confirmed. Reparations to U.S.S.R. (300 million dollars) in commodities over 8 years.
Italy. Signed Feb. 10, 1947, ratified July 31. Cession to France of the Little St. Bernard Pass, Mont Cenis plateau, Mont Thabor-Chaberton area, and the Tenda-Briga area of the Maritime Alps, and restoration of Nice, etc.; cession to Yugoslavia of former It. territory on frontier, Zara, Is. off	Slam. Signed June 1, 1946; effective at once; with Great Britain and India. Restoration of all occupied territory; compensation for damage and destruction. Rice surplus (max. 1,600,000 tons) to be handed over to Far East rice organization.

X

OUR letter X got into the alphabet by starting as a chair back. That is what the sign  represented in the picture-writing of the Egyptians. In the hieratic writing it became  and the Phoenicians added some more horizontal bars and made it  (*samekh*), out of which grew the Greek . The Greeks also developed another form , which passed to the Romans and from them to us. It is thought that *samekh* was also

sometimes written  and that from this two characters developed: one  by removing the vertical lines, and the other  by removing the enclosing square. Then the latter was tilted over and became X. In classical Greek the character  came to be used for the letter *chi* (sounded *kh*), while the  was used for the *ks* sound. In English we pronounce X as *ks* in *extra*, as *gz* in *exact*, and as *z* at the beginning of such a word as *xylophone*

Xanadu. In Coleridge's "Kubla Khan," an imaginary city, residence of the Khan Kubla or Kublai; description based on that of Khan Kubla's palace in the book *Purchas His Pilgrimes* by Samuel Purchas (1625).

Xanthium. A small genus of plants of the family *Ambrosiaceae*, having coarsely-toothed leaves and a spiny burr as fruit; known as cockle-burr or clot-burr.

Xanthopteryx superba. Moth, 2-143 illus.

Xavier (sâ'vier), St. Francis (1606-52). Span. Jesuit missionary and saint, associated with Loyola in founding the Jesuits, 7-606; and Loyola, 5-46; in Japan, 4-349; burial at Goa, 1-517.

Xenon (Xe). Gaseous element atomic no. 54; atomic weight, 131.3; melts at -140° C.; 7-606, 3-224; in air, 1-80, 81; discovered first in the sun by Ramsey, 6-363.

Xenophon (zen'ofon) (430-354 B.C.). Gk. historian; and philosophy of Socrates, 7-82.

Xerez de la Frontera *Sic Jerez*.

Xerxes (zêrk'sêz) I (c. 519-465 B.C.). King of Persia; expedition against Greece, 6-130; and the Hellespont, 3-49; relief-howing tribute brought to, 6-129 illus.

Xeuxis (7. 4th cent. A.C.). Gk. painter, "realist," using light and shadow (then now); legend says, painted grapes at which birds pecked; 4-80.

XI, Σ (Rom. x, X). 14th letter of Gk. alphabet.

Ximenes (hîmâ'nâz) de Cisneros, Francisco (1430-1517). Sp. cardinal and statesman; and Inquisition, 4-263

Xingu. A large s. tributary of the r Amazon, in Brazil; 1,200 m. long

Xochimilco, Mexico. Floating gardens, 5-187 illus.

X-Ray Crystallography. The study of the position of the atoms in a crystal

by the reflection of X-rays from the several faces of the crystal.

X-Rays. Electromagnetic waves of very short wavelength which are set up when the velocities of electrons are altered suddenly. X-rays are of the same nature as light. They can penetrate solid substances and affect photographic plates, 7-507; fluorescence excited by, 6-162; ionising effects, 4-277; in surgery 7-195. wavelength, 3-221.



X-Ray Spectrometer. Instrument for measuring an X-ray spectrum. Used for determining the wavelengths of X-rays and the relative intensities of different wavelengths in an X-ray beam.

Xylonite (zî'lonit). A variety of the plastic celluloid.

Xylophone (zî'lofôn) Percussion instrument, 5-307.

Xylose. Sugar obtained from cotton seed husks, 2-518

Y

THE twenty-fifth letter of the alphabet is one of the four letters (U, V, W, Y) which have developed out of the Greek *upsilon* . And these are all related to the letter F, being derived from the Egyptian hieroglyphic picture of the horned asp . The two horns and the body of the asp appear even better in Y than in the letter F (read the story of F). In the Middle English period Y was a favourite with penmen on account of its

final flourish, and they frequently used it in place of a final I. That is why to-day we write "city," "fairy," and "kindly," but where Y is not terminal use I, as in "cities," "fairies," "kindest." In old English books Y often represents the *th* sound, as in *ye* for *the* because of its resemblance to Anglo-Saxon *ƿ* (called thorn), which had the sound *th*. Printers, not having this letter, replaced it sometimes by *th* and sometimes by *ye*.

Yabloni Mts. A system of s. Siberia, extending from s.w. to n.e. 1,000 m. towards the Stanovoi range; highest point about 8,000 ft.; 6-472.

Yachts and Yachting. 7-509.

Yaffle. The green woodpecker, 7-468.

Yahgan Indians. Tribe of S. Amer. Indians, 7-98.

Yahoos. In *Gulliver's Travels*, 7-207.

Yahweh. See *Jehovah*.

Yak. Ox-like animal of Tibet, 7-511, 1-267 illus.

Yakut. Turkic people of Lena basin, E. Siberia; number 250,000.

Yakutsk. Autonomous republic of the U.S.S.R., consisting chiefly of the former Siberian prov. of Yakutsk; area 1,457,000 sq. m.; pop. 400,500; cap. Yakutsk; climate, 2-410.

Yale, Elihu (1648-1721). Eng. philanthropist; founder of Yale Univ., Connecticut, U.S.A.

Yale, Linus (1821-68). Amer. lock smith, inventor of the pin-tumbler or "Yale" lock, 4-538.

Yale University. at New Haven, Connecticut; 3rd oldest univ. in U.S.A.; men, non-sect.; chartered 1701 as Collegiate School of Connecticut, name changed 1718 in honour of Elihu Yale; arts and science, medicine, divinity, law, fine arts, music, forestry; 2-486, 7-368.

"Y-alloy." Trade name for an aluminium based light alloy, 1-115.

Yalta. Tn. of R.S.F.S.R., on s.e. coast of Crimea, 35 m. E. of Sevastopol; holiday resort; Yalta Conference of war held Feb. 4-12, 1945, between Churchill, Stalin, and Roosevelt; plans made for 4-fold division of Ger., formation of internat. anti-war charter 3-power help for liberated Europe, and the drawing of the Curzon Line, 7-142.

Yalu. R. of E. Asia on borders of Manchuria and Korea; length 300 m.; hydro-electric installations, 4-425.

Yam. A vegetable resembling the sweet potato.

Yamato and Tosa school of Jap. painting. 4-352.

Yanam. Former Fr. settlement on the Coromandel coast, India, 4-240. Occupied by India, 1954.

Yangtsé River. China's longest and most important waterway, 7-511, 512 illus.; population in valley 1-368; gorges, 2-361; rice grown in valley, 6-397. Shanghai 7-15.

Yankoe. European nickname for a white inhabitant of the U.S.A.; in the U.S.A. applied to the people of New England; also by the inhabitants of the southern states to those of the northern states. Word may

be a corruption of English, or Anglin, as used by the Massachusetts Indians.

Yap. One of Caroline Is. (Pacific) formerly German, then Jap.; occupied by U.S.A. 1945; cable station

Yapura or Japura (yahpûrah'). One of chief tributaries of Amazon, rising in Colombian Andes; 1,800 m.

Yaqui. R. of Mexico. Rises in N. part of Sonora, flows 500 m. to enter Gulf of California, 6-186.

Yaqui Indians. Mex. tribe living in Sonora; engaged in agriculture, weaving, highly developed clan system; much reduced in numbers by wars arising from rebellions against Mex. govt.

Yard, a unit of distance. See *Weights and Measures* (list).

Yard. See *Nautical Terms* (list).

Yare. A river of Norfolk, Eng., flowing 60 m. to the North Sea at Yarmouth.

Yarkand. Trade centre in Chinese Turkistan (Sinkiang), in rich oasis of Yarkand and on Yarkand r., 100 m. s.e. of Kashgar; pop. 118,560; 1-268.

Yarmouth, Great. Spt. and holiday resort in Norfolk, Eng., on E. coast; pop. 51,105; herring fisheries, 5-448; fishing fleet, 3-373 illus.

Yarn. 2-520.

YAROSLAVL

Yaroslavl (Ярославль). Port of R.S.F.S.R. on Volga r., 160 m. N.E. of Moscow; pop. 298,000; textiles; 18th-cent. cathedral.

Yarra. R. on which Melbourne, Victoria, Australia, stands; flows into Port Phillip and is navigable for large vessels to Melbourne; length 100 m.; 5-167.

Yarrow, Sir Alfred Fernandez. (1843-1932). Brit. marine engineer and shipbuilder; founded in 1866 firm of Yarrow and Huley; specialized in high-speed vessels, particularly torpedo-boats and destroyers; designed the Yarrow water-tube boiler; gave much money for research.

Yarrow Water. R. of Scot., 6-531.

Yawl. A fishing boat, 3-380.

Yeames (Yams), William (1835-1919). Brit. artist, b. in Russia; painted many fine historical pictures; R.A. 1878.

Year, in calendar, 2-174; Egyptian, 3-184; light year, 1-282, 284; months of, 5-255.

Yeast. A microscopic fungus plant, 7-512; in making alcohol, 1-96; enzyme secretion, 3-294; and fermentation, 3-346; as fungus, 3-489; leavening of bread, 2-50.

Yeats (yāt), Jack Butler (b. 1871). Irish painter and illustrator; brother of W. B.; wrote *Life in the West of Ireland*, illustrated books by Synge and other Irish writers.

Yeats, William Butler (1865-1939). Irish poet and dramatist; connected with Celtic revival and Irish Theatre movement (*The Land of Heart's Desire*; *Deirdre*; *The Wild Swans at Coole*; J. M. Synge and the *Irish of His Time*; *Michael Robartes and the Dancer*); 3-291; portraits, 4-287 illus.

Yellow, pigment, 6-38; in signals, 7-52.

Yellow Bunting (*Emberiza citrinella*).

Bird, 2-121.

Yellow Chanterelle. A fungus, 3-184 illus.

Yellow Fever. A disease transmitted by mosquitoes, 5-271; in lethmus of Panama, 6-53.

Yellow Goat-fish, 5-128 illus.

Yellow Kamkier. See **Yellow Bunting**.

Yellow Ox-eye. See **Corn Marigold**.

Yellow Phosphorus, used on matches, 5-147, 6-162.

Yellow River. See **Iwang-ho**.

Yellow Sea or Hwang-hai. N. portion of China Sea between Korea, Manchuria, and China; length, about 620 m.; greatest breadth, 400 m.; reason for name, 4-213, 1-265.

Yellowstone Park, in Rocky Mts., U.S.A.; area 3,471 sq. m.; lies mostly in N.W. Wyoming; 7-513; billion reservation 1-476; geysers, 4-15.

Yellowstone River, U.S.A. Trib. of Missouri, rises in Yellowstone Lake; length, 671 m.; 7-513.

Yellow Underwing moth, 2-144 illus.

Yellow Wagtail. Bird; migration, 5-204 illus. f.

Yemen (yā'men). Inmate or principality of s.w. Arabia on Red Sea; area 75,000 sq. m.; pop. 3,500,000; mountainous country with low plains on coast; cap. Sana; coffee trade, 1-191.

Yen. See **Money** (lat).

Yenisei (yenisei'). One of great rivers of Siberia; rises in N.W. Mongolia, flows s. to Bay of Yenisei, an inlet of Arctic Ocean; 1-268, 6-472, 7-48.

Yeo'manny. Force of volunteer cavalry, since 1907 included in the Territorial Army; the force first came into existence in 1761 for the purpose of quelling local riots, but was not organized until 1794.

Yeomen of the Guard, 1-410.

Yeomen Warders of the Tower, 1-410, 7-301.

Yevoli. Market tn. in Somerset, Eng.; agricultural centre; noted for glove-making aircraft work; 7-88.

Yerba Maté. National drink of Paraguay, made from the yerba tree; a species of holly, 6-76.

Yerkes, Charles Tyson (1837-1903). Amer. capitalist and patron of science and art; obtained control of and exploited Chicago city railways; gave great Yerkes telescope to Univ. of Chicago, 7-250.

Yerkes Observatory, Chicago Univ., U.S.A.; telescope, 7-250, 5-494.

Yermak (d. 1585). Cossack outlaw, initiator of Russian conquest of Siberia; made prince of Siberia by Ivan the Terrible.

Yew. An evergreen tree, 7-153, 154 illus.; wood used for bows, 1-207; poisonous berries, 6-236, 237 illus.

Yead, Ferial. City 165 m. s.e. of I-pa han; pop. 60,000; on important trade route; cobalt, antimony, and nickel in vicinity.

Yezidis. Religious sect in Iraq, known as devil-worshippers, 4-280.

Yggdrasil. In Norse myth., the tree of life. The branches spread above the heavens and animals dwell in them.

Yiddish. Ger. dialect spoken by Jews; origin of language, 4-152.

Ylang Ylang. An oil obtained from the flowers of *Cananga odorata*, a tree of the custard-apple family, 5-506.

Ymir. In Norse myth., a frost giant, the first being created; slain by Odin and other gods, who formed the earth from his body.

Ymuiden or IJmuiden (Emmuden). Tn. of the Netherlands. N. Sea Canal connects it with Amsterdam; fishing; ice and chemical works; pop. 46,000.

Yogi. Member of a Hindu sect (Yoga) in India, 7-514.

Yokohama. Chief apt. of Japan; pop. 1,143,287; 7-514, 4-340, 342.

Yom Kippur. See **Atonement**, Day of.

Yonge, Charlotte Mary (1823-1901).

Brit. novelist and writer on religious and educational subjects (*The Hour of Redcliffe*; *The Daisy Chain*; *Heartsease*; *The Book of Golden Deeds*).

Yonkers, New York, U.S.A. Mfg. and residential city on Hudson r., adjoining New York City on N.; pop. 152,798; carpets, hats, lifts, sugar, electrical supplies, clothing.

Yonne. Tributary of r. Seine Fr. 150 m. long, 6-530.

York, Richard, Duke of (1111-40). Eng. prince; protector of Eng. during illness of Henry VI.

York, House of. Name given to royal descendants of Edmund, Duke of York (1311-1402). They reigned in Eng. 1401-85 (Edward IV, Edward V, Richard III). See **English History**; **Roses**, Wars of the, and the above-mentioned kings.

York. Cath. city and co. tn. of Yorks, Eng.; pop. 105,336; 7-514; minster, 3-252, 2-269 illus.; mystery play cycle, 3-117.

York Ham. Curing method, 1-342.

Yorkshire. Largest co. of Eng.; area 6,077 sq. m.; pop. 4,621,698; 7-515, 516 illus.; carboniferous limestone and potholes, 4-510; moorland, 3-248; national park, 7-515.

Yorktown, Virginia, U.S.A. Historic tn. on Chesapeake Bay, 60 m. s.e. of Richmond; here during the War of Amer. Independence, Cornwallis sought shelter with his men; Cornwallis's surrender (1781), 1-139.

Yorubas. Tribe of s.w. Nigeria, 5-436.

Yosemite National Park, Calif., U.S.A., containing magnificently wild scenery, occupies some 1,500 sq. m.

Yosemite Valley, in cent. Calif., U.S.A., part of Yosemite National Park, a great gorge between 7 and 8 miles long; surrounded by scenery of wildest kind, granite formations.

Youghal (yoo'ahl) Irish Rep. Spt. and resort in co. Cork on Blackwater r., 27 m. E. of Cork; fisheries; has house of Sir Walter Raleigh.

Young, Arthur (1741-1820). Influential Brit. writer on agriculture and social economy, on Eng. roads, 6-404.

Young, Brigham (1801-77). Successor, as head of Mormons to Joseph Smith, its founder, 6-264, 263 illus., 7-371. Young had over 20 wives, and 57 children.

YUGOSLAVIA

Young, Edward (1683-1765). Eng. poet, whose famous verse on *Night Thoughts on Life, Death, and Immortality*; this contains passages of fine imagination and many phrases which have passed into proverbial speech ("Procrastination is the thief of time"), but is marred by its gloomy tone.

Young, Frances Brett (1884-1954). Brit. novelist and poet. (*Cold Harbour*; *Portrait of Clare*; *My Brother Jonathan*; *A Man About the House*).

Many stories set in Welsh borderland. **Young**, James (1811-83). Brit. scientist, estab. coal distillation works c. 1850; devised way of refining crude oil, 6-148.

Young, Thomas (1773-1829). Brit. scientist, linguist, and Egyptologist; theory of colour vision, 2-463; experiment in interference of light, 4-500; and Rosetta Stone, 5-455, 5-183.

Young Italy, Association of. Revolutionary movement founded by Mazzini in 1832, 5-151 4-316.

Young Men's Christian Association (Y.M.C.A.). Christian social service organization, founded 1844; membership 2,000,000; emblem, red triangle with point downwards, 2-125.

Young Pretender, The. See **Charles Edward**.

Youngstown. City in Ohio on Mahoning r., 2nd largest steel centre in U.S.A.; pop. 168,330.

Young Turk Party. Turkish political organization; Kemal Atatürk and 4-396.

Young Women's Christian Association (Y.W.C.A.). founded 1857; Christian social service institution; emblem, blue triangle with point downwards. **Youth Clubs**, origin of, 2-424.

Youth Hostels, 7-516.

Ypres. Tn. in w. Flanders prov. of Belgium. Of great importance in Middle Ages; mfrs. include textiles, lace, biscuits; pop. 16,000. in 1st World War, 7-478.

Ysaie (izai), Eugene (1858-1931). Belgian violinist, one of the most famous players of his time.

Yser (is'er) River. Fr. and Belgian; rising 20 m. s.e. of Calais and flowing E. and N. to sea at Nieuport.

Yssel. It. of the Netherlands, a distributary of the Rhine from which it branches 2 m. above Arnhem to flow N. and N.E. to Ysselmeer.

Ysselmeer. Fresh-water lake of the Netherlands, remnant of the Zuider Zee, 5-377 3-30; sluice gates, 3-12 illus.

Ytterbium (Yb). Chem. element, atomic no. 70; atomic weight 173.04 3-224.

Ytterby or Ytter. Swed. village where rare earths were first obtained; gave name to ytterbium, terbium, yttrium.

Yttrium (Y). Chem. element, atomic no. 39; atomic weight 88.92; 3-221.

Yuan dynasty. Rulers of China (1206-1368), dynasty founded by Kublai Khan, 5-237.

Yuan Shi-Kai (1859-1916). Chinese soldier and statesman, pres. of republic of China from 1913 until his death.

Yucatan. A peninsula of Mexico. The state of Yucatán occupies the N. part of peninsula; area 23,926 sq. m. pop. 153,899; cap. Mérida; 7-517.

Yucatan Channel or Straits. Between Gulf of Mexico and Caribbean Sea.

Yucca. Plant of tree of lily family native in N. and Central America and Mexico; "Spanish bayonet" is a species so called from its long sharply pointed leaves; this and other species are frequently grown out doors in England; flowers, on a long spike in centre of rosette of leaves are bell-shaped, whitish and very numerous.

Yugoslavia. Country of the Balkans, area 99,000 sq. m.; pop. 15,772,098 federal cap. Belgrade, 7-517; map 7-518; flag, 3-384 illus. f.; Dalmatian 3-28; Macedonia, 5-63; Montenegro 5-250. Serbia, 5-534; before 1st

World War, 7-478; in 2nd World War, 7-490, 496.
Yu'kon. A large r. of N. Amer., partly in Canada, partly in Alaska; flows to Bering Sea; 1,924 m. long, 7-520, 5-432.
Yukon Territory. In north-western Canada; area 207,076 sq. m.; pop. 9,096. Capital, Whitehorse (2,584). 7-520.
Yule. The Scandinavian word early Saxon name for Christmas (q.v.).

Yuma ("sons of the river"). Chief tribe of Yuman stock of N. Amer. Indians; lived originally in lands at confluence of Gila and Colorado rs., U.S.A.
Yuman. A linguistic stock of N. Amer. Indians, living in s.w. U.S.A. and w. Mexico; agric. people; chief tribes grouped among "pueblo" Indians.
Yumrukehul. Highest mt in Balkans, 7,786 ft. 1-750.

Yunco. Name of a Peruvian nation who lived in ancient times on Pacific coast; examples of their culture are shown by their great monuments still existing near the modern city of Trujillo.
Yunnan. s.w. prov. of China; area 146,714 sq. m.; pop. 10,853,360; rich copper mines; exports tin; cap. Kunming.
Yusuf ibn Ayyub (Yūsuf ibn ʿAlī) (original name of Saladin (q.v.))

Z

OUR Z comes from the Greek letter *Zeta*, written thus: **Z**. Originally in Egyptian picture-writing it represented a duck. Written in a running hand (the "hieratic" form), it became the symbol **ⲫ** and then in the Phoenician and early Greek alphabets came to look more like the letter **I** crushed down **Ⲛ**. As the letter became more crushed the vertical became diagonal and finally slipped at top and bottom so as to joint the horizontals as in the Z to-day.

Among the Phoenicians it was the 7th letter and so remained in the Greek and early Latin alphabets, but it was dropped from the Latin, the 3rd century A.D. Later, when the study of Greek became a mark of culture among the Romans, it was restored, but it had lost its place in the alphabet and had to fall in at the tail of the procession, where it still remains. It was called *zed* in Old French and *ezed* in Early English; hence the queer old name of *izzard* for the letter Z. In the U.S.A. it is called *zee*.

Zacapa. Tn. in Guatemala, Cent. Amer., pop. 24,033; 4-101.
Zacatecas [sahkuhtá'kahs]. State in cent. Mexico; area 28,000 sq. m.; pop. 565,400; silver mines, 6-187.
Zacatecas, Mexico. Cap. of state of Zacatecas, 350 m. s.w. of Mexico City; pop. 21,865.
Zadar. See **Zara**.
Zagreb [zahgreb] or **Agram**. City of S.W. Yugoslavia; linen, carpets, leather; pop. 290,667; 7-518.
Zaharoff, Sir Basil (1849-1936). (Gk. financier; acquired vast fortune out of dealings in armaments; made many donations to charity and science.
Zaibatsu. Eight wealthy Jap. families who controlled Jap. trade, 4-343.
Zama, Battle of (202 B.C.), defeat of Hannibal by Scipio Africanus, 4-127.
Zambezi. R. of Africa, 7-521, 6-395, 1-49; Victoria Falls, 7-397 with illus. f. 1-61 illus.
Zamboanga. Tn. in Philippine Is.; pop. 103,317; 6-156.
Zamenhof, Lazarus (1859-1917). Inventor of Esperanto, 3-296.
Zang'will, Israel (1861-1926). Brit. (Jewish) novelist and dramatist (*Children of the Ghetto*; *Chosen Peoples*; *The Willing Pol*); prominent Zionist.
Zanzibar. Isl. close to E. coast of Africa; area 640 sq. m.; pop. 149,575. With Pemba, a neighbouring isl. and various small isls, it forms a Brit. protectorate. Total area of protectorate, 1,020 sq. m.; pop. 266,000; cap. city, Zanzibar, pop. 45,281; 7-521, 522 illus.
Zanzibar. Cap. of Zanzibar protectorate, on west coast of Zanzibar island; pop. 45,281; 7-521, 522 illus.
Zaporozhe, Ukraine (formerly Alexandrovsk). City on r. Dnieper; riv. and waterway junction; pop. 289,000; Dnieper dam, built here 1932, reconstructed after 2nd World War.
Zapotec. Anc. people of Mexico, 1-334; pottery, 1-333 illus.
Zara (zah'ra), or **Zadar**. Adriatic port on Dalmatian coast, 90 m. s.e. of Fiume; pop. 18,600; assigned to It. by Treaty of Rapallo (1920), and to Yugoslavia after 2nd World War.
Zaratushtra. Same as Zoroaster.
Zatopek, Emil (b. 1922). Czech athlete; long-distance runner. World record for 10,000 metres (1950); 20,000 metres (1951); 10 miles (1951).
Zealand. Largest of Dan. isls. Copenhagen on, 3-72 with map.
Zealand (Dutch *Zeeland*). Prov. of s.w. Netherlands; area 690 sq. m.; pop. 273,690; cap. Middelburg.

Zebra. Animal of the horse family (*Equidae*), 7-522, 1-56; at a water-hole, 1-66 illus. f.; in Kruger Nat. Park, 7-91 illus.
Ze'bu. The Indian ox, having characteristic hump; is of a greyish-white colour and noted for endurance under tropical heat; milk from, 5-205.
Zebulon [zeb'yóblon]. Hebrew patriarch, son of Jacob and ancestor of the tribe of Zebulon.
Zechariah [zekar'ia] (6th-5th cents. B.C.). Hebrew minor prophet; returned to Palestine from captivity and promoted rebuilding of the temple.
Zedekiah. Youngest son of Joseph and last king of Judah; ended his life blinded and a prisoner in Babylon.
Zeebrugge [zébruggel]. Sp. of N. Belgium; Ger. submarine base (1914-18); famous British naval raid, April 23, 1918, 2-98.
Zemur. Formerly Semlin, tn. of Yugoslavia; pop. 28,080.
Zenana [zánah'na]. In India, women's apartments in the house of a wealthy high-caste Hindu.
Zend. Anc. language still used by Parsees for religious purposes; mod. Persian derived from, 6-93.
Zend-Avesta. The collection of Zoroastrian scriptures, 7-527, 6-93.
Zennor. Vill. in Cornwall, Eng.; mermaid of Zennor, 5-175 illus.
Zeno of Citium (c. 340-264 B.C.). Gk. philosopher, founder of the Stoic school of philosophy; 6-160; tutor to Pericles, 6-125.
Zeno of Elea (5th cent. B.C.). Gk. philosopher; inventor of many ingenious paradoxes to discredit common beliefs about time, space, and motion; taught the unity of all being.
Zephaniah. A Hebrew minor prophet, said to have lived in 7th cent. B.C.; prophesied; punishment of Israel for its sins.
Zephyrine Doulis. Variety of rambling rose, 6-453 illus. f.
Zephyrus. In Gk. myth., the west wind, 7-389.
Zeppelin, Ferdinand Count von (1838-1917). German aeronaut and engineer; pioneer of the rigid airship, 1-83.
Zeppelin. Type of airship designed by above; development, and use in First World War, 1-83.
Zeta, ζ , ζ (Rom. z, Z). 6th letter of Gk. alphabet.
Zetland. Alternative name of the Shetland Is., used chiefly by Marquesses of Zetland and in parl. div. Orkney and Zetland.

Zeus. The father of the gods in Gk. myth. Called by the Romans Jupiter or Jove, 7-522, 323 illus. 7-319, 4-386; and Danaë, 6-124. Olympic Games, 5-508; and Prometheus, 6-294; statue by Phidias, 7-1, 6-153, 4-72 illus. f.
Zhukov, Grigori Konstantinovich (b. 1895). Russ. general of 2nd World War; chief of general staff and vice-commissioner for defence, 1941-41; commander of 1st Ukrainian Army, 1944, then of 1st White Russian Army in advance on Berlin, 1945. Deputy min. of armed forces of Soviet Union from 1946-53; deputy min. of defence, 1953.
Ziegfeld, Florenz (1869-1932). American theatrical manager. Famous for his "Ziegfeld Follies" revues.
Zimbabwe. Bantu name for ancient stone strongholds in S. Rhodesia.
Zinc (Zn). Bluish-white metallic element; atomic no. 30; atomic weight 65.39; melts at 119.5°C. 7-523, 3-224; alloys, 1-115; in brass, 2-41; chemical reaction with sulphuric acid, 1-12.
Zinc Etching, for reproduction of line drawings, 6-203.
Zinc Sulphate or **White Vitriol**, 1-12.
Zinc Sulphide, fluorescence, 6-162.
Zinke (mus. instr.). See **Cornett**.
Zinkens, Anna Katrina (b. 1901). British artist. Made her name particularly as a poster artist. Her sister Doris became equally well known as a designer of scenery for stage and films.
Zinnia. A genus of the *Compositae*, native to Mexico and Cent. Amer.; the garden zinnia (*Zinnia elegans*) is the best-known species.
Zinoviev, Grigory Evseevich (1883-1936). Russian politician, President of 3rd International (1919). Name became prominent in Eng. in 1924 when a letter from him, purporting to call on English Communists and Socialists to rebel, was pub. in a London newspaper just before General Election, and contributed to defeat of first Labour government. Sentenced to 10 years imprisonment in 1935 for conspiracy against Stalin régime. Shot in 1936.
Zion. Jewish site stronghold at Jerusalem, captured by David; name also applied to all Jerusalem.
Zionism. Jewish movement for return to Palestine, late 19th and early 20th cents., 4-302.
Zircon. A semi-precious stone; a silicate of zirconium, 7-523, 7-166. See also **Stones, Precious**.
Zirconia. An oxide of zirconium, 7-523.

ZIRCONIUM

Zirconium (Zr). Chem. element; atomic no. 40; atomic weight 91.22; melts at 1,857° C.; 7-523, 3-374.

Zizka, John (c. 1360-1324). Bohemian Hussite leader, great general, and post legendary hero; died at of apparent triumph over error Sigismund.

Zither. Stringed musical instrument; a shallow box approx. 20 in. long, 10 in. wide, 3 in. deep, with five melody strings of wire, a varying number of accompaniment strings of gut providing complete chromatic scale, and 12 bass strings an octave lower in pitch than the accompaniment strings. Common in Bavaria and Austria.

Zila. Town of Czechoslovakia, in district of Moravia; pop. 45,700; factories of the Hala boot and shoe company; 3-22.

Zloty. See Money (list).

Zodiac. A zone in the sky, traversed by the sun and planets, 7-524.

Zodiacal Light. A celestial phenomenon of unknown origin, observable as a cone of faint light in the sky after sunset at the end of March or before sunrise during October.

Zootrope. A toy showing moving pictures; in development of cinema, 3-358.

Zoffany, John (1726-1819). Ger. painter who worked in Eng.; became celebrated portraitist; portrait of Jane Austen, 1-341 illus.

Zog (b. 1895). Ex-King of Albania, son of a tribal chief and a Muslim; pres. of Albanian republic 1928-29, then becoming king. Escaped to Eng. on Italian occupation of Albania (1939); later lived in Egypt; 1-92.

Zola, Emile (1840-1902). Fr. novelist, leading exponent of realism, 5-472, 5-466.

Zollern [tsol'ern]. Ancestral home of Hohenzollerns, near the Danube in Swabia, s.w. Ger.; built in 980, rebuilt, 1850-56.

Zollverein [tsol'ferin] (Ger. Zoll, "custom," Verein, "union"). A union of Ger. states, instituted 1819, for maintenance of uniform rates of duty on foreign imports and of free trade among themselves; term now used generally for certain form of customs union.

Zone (time). Since 1883 many countries have adopted the system of standard time by zones. In the U.S.A. and Canada five standard times are used, the countries being

divided into five zones for the purpose, 7-277, 378.

Zoological Gardens, 7-524.

Zoological Society of London. Society for the scientific study of animals, founded 1828. Has collection of living animals at Regent's Park, London, and Whippsnade, Bedfordshire, 7-525, 526.

Zoology, 7-526; animal behaviour, 1-181; animal kingdom, 1-134; animal parasites, 6-78; compared with botany, 1-134; classification of animals, 4-449, 3-14; ecology, 3-158; mammals, 5-100; prehistoric animals, 6-281; protective coloration, 6-296; protozoa, 6-298; reptiles, 6-383; selective breeding, 4-188. See also Biology; Cell Evolution; Heredity, and individual animals and animal groups.

Zooplankton. See Protozoa.

Zorn [saw'n], Anders Leonhard (1860-1920). Swedish landscape, figure, and portrait painter; one of the greatest artists of his time; 2-360.

Zorndorf [tsaw'n'dorf]. Vil. of Prussia, 53 m. N.W. of Berlin; victory of Frederick the Great over the Rus. under Vornor (Aug. 25, 1758), 7-2.

Zoroaster. Persian teacher, founder of Zoroastrianism, 7-527; worshipped by Medes, 5-160.

Zoroastrianism. Religion of anc. Persia practised by Parsies in India; named after Zoroaster. Central idea was of a world contest between the forces of good and evil, or light and darkness, personified as Ormuzd and Ahriman, in which contest it was Man's duty to help the good; 1-269, 4-241, 6-93, 7-527.

Zoser. King of Egypt; his step-pyramid, 3-184, 185 illus.

Zoshchinko, Michael (b. 1893) Russ. humorous author, satirised many Soviet institutions; rebuked by govt. and admitted "errors" in 1948; 6-481.

Zouaves. Fr. infantry corps originally recruited in Algeria from the Zouawa, a tribe of Berbers, but later drawn from Fr.; their full dress is a semi-Moorish uniform.

Zouawa. Kabyle tribe of Algeria; Fr. Zouave regiments named from, 1-110.

Zubair, Iraq; oil field, 4-280.

Zugspitze [tsöögspéts]. Mt. peak in Ger. about 10,000 ft. high, 4-1.

Zuider Zee. Former arm of North Sea extending s. into Netherlands. By land reclamation it has been reduced

ZYMASE

to the fresh-water lake Yaelmeer, 5-377, 5-378, 3-30.

Zucker, Adolph (b. 1874). Amer. film producer, 3-396.

Zuleaga, Ignacio (1870-1945). Sp. painter, 7-121; landscape with figures, 7-120 illus.

Zulu. Brit. territory since 1887; annexed to Natal, S. Africa, in 1897; area 10,427 sq. m.; pop. 423,321; 7-527, 528.

Zulus. A S. African people of Bantu stock, 7-527, 1-51, 6-335 illus.; war with Brit., 7-51; worship of snakes, 5-312; ring money, 5-334 illus.; craftsman, 1-83 illus.; mother and child, 7-89 illus.; village, 7-95 illus.

Zuni [söonyé]. Tribe of Pueblo Indians inhabiting N. New Mexico-Arizona region of U.S.A.

Zurbard, Francesco (1598-1664). Sp. painter, 7-112.

Zürich. Largest city in Switz., pop. 380,000; cap. of Zürich canton; 7-529, 4-215; cathedral in Grossmünster church, 1-426; first hydro-electric station, 4-217.

Zürich, Lake. Swiss lake, chiefly in s. part of canton of Zürich; area 34 sq. m.; city of Zürich at N. end; lake-dwellings, 4-439.

Zutphen [züt'fen]. Tn. in s.w. Netherlands, several times taken and sacked; pop. 21,500; Sir Philip Sidney at, 7-51.

Zuyder Zee. See Zuider Zee.

Zwickau [zvük'ow]. Ger. mfg. tn. of Saxony, 60 m. s.w. of Dresden, on r. Mulde, pop. 84,700; old churches; coal fields, 4-4.

Zwingli, Ulrich (1484-1531). Swiss Protestant reformer, 7-528, 6-377, 2-380.

Zwolle [zvol's], Netherlands. Cap. of prov. of Overysel, 60 m. N.E. of Amsterdam; pop. 50,870; centre of v. and E. canal systems, cotton, iron, ships; cattle and fish market; near by Thomas & Kempe lived and died.

Zworykin, Vladimir Kosma (b. 1889). U.S. television and electronics experimenter, Russian-born; wrote *Television* (1940); *Photo-electricity and its Applications* (1948).

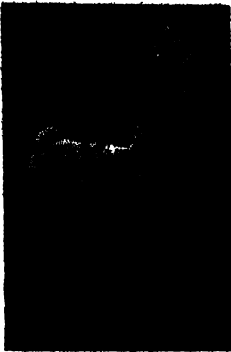
Zygona alipendulae. Moth, 2-142 illus.

Zygomatic Process. A prolongation of the temporal bone which supports the malar bone.

Zymase [zím'ás]. A ferment found in yeast, 1-96, 7-512, 2-294.

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A "BOOK OF KNOWLEDGE" PICTURE QUIZ



What animal ? 1-119



What sculpture ? 6-521



Who painted this ? 7-385



What and Where ? 1-149



Where are these houses ? 3-110



Who, and what game ? 6-254



What Biblical character ? 5-138



Who ? 3-231



What ? 7-30



What did she discover ? 3-11



What bell is this ? 6-153



What are they doing ? 3-486



What type of boat ? 1-499

PICTURE QUIZ



Where ? 6-207



What is this ? 6-152 1



What event ? 8-137 1



What berries ? 8-207



Who ? 1-411



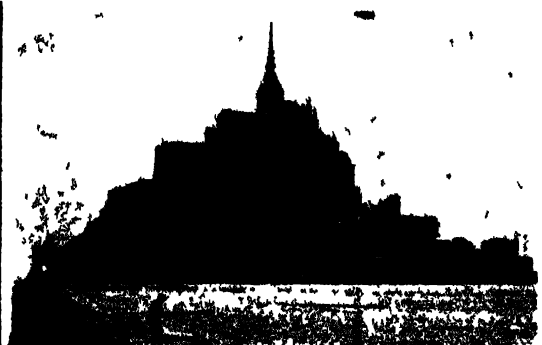
What is it ? 5-116



What animal ? 4-478



Name and artist ? 8-382 0



Where is this ? 5-448

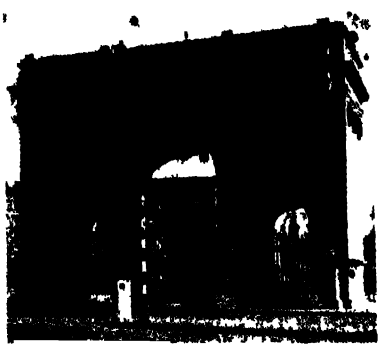


What is he holding ? 7-212



What is this ? 2-362

PICTURE QUIZ



Where are these three arches, and what is each called ? 6 447 , 6-85 , 5-26



What is being grown here ? 6 204

Whose monument ? 7 415

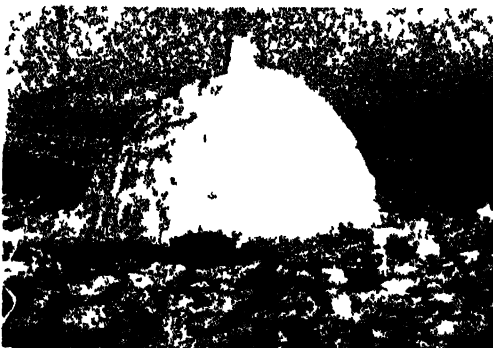


Who ? 5-53

What bird ? 7-169

Who ? 7-337

What has he got ? 6 250



What people build such homes ? 3-297

What ? 6-524

What animal ? 7 227 .

PICTURE QUIZ



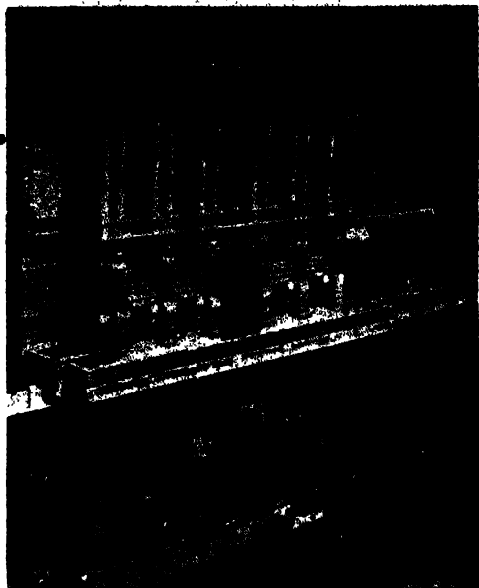
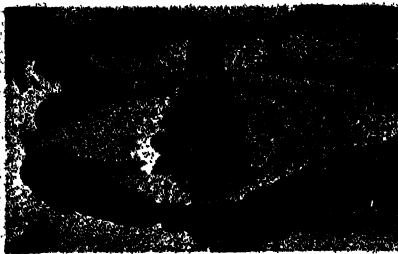
What animal ? 1-2



Who are these two ? 4-20



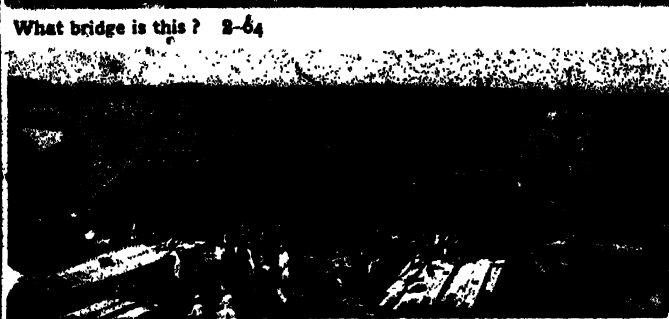
What is he sitting on ? 7-428



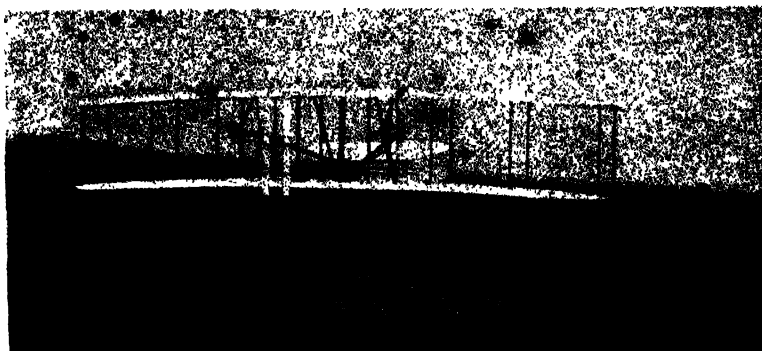
What building is this ? 1-362



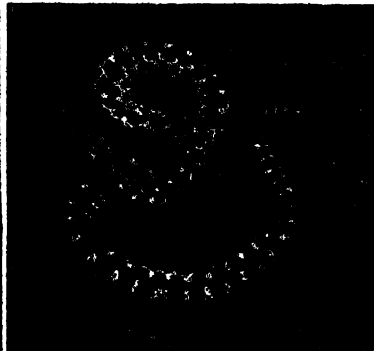
What bridge is this ? 2-64



What is inside this ? 2-408



What is shown here ? 1-26



Is this snake dangerous ? 7-402



What ? 4-56

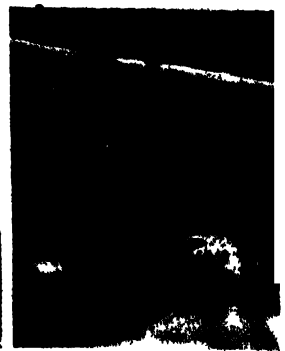


Who ? 4-462

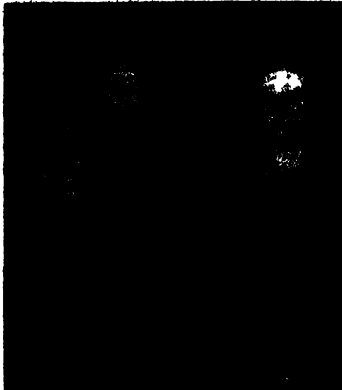


Where did this sculpture come from ? 4-90

PICTURE QUIZ

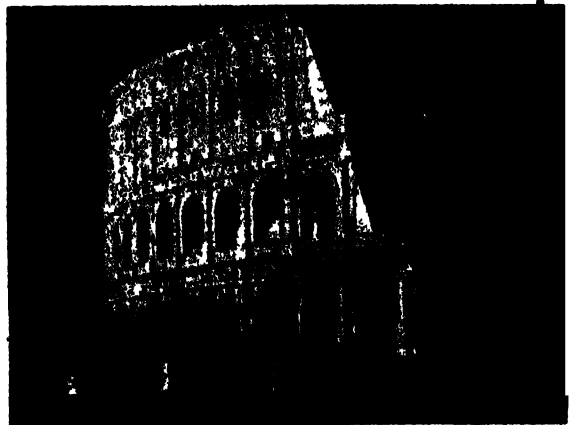
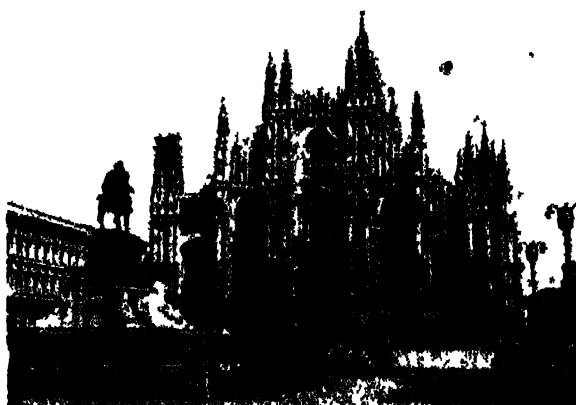


What are the various names of these animals? 1-181; 1-181, 5-101, 5-103



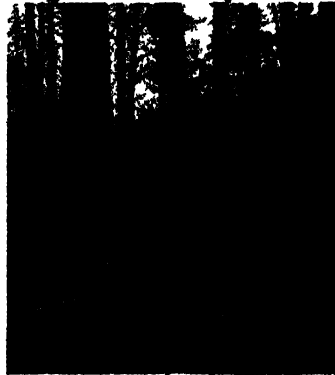
Who are they? 2-92

Who painted this famous picture? 1-184



Where is this cathedral? 5-204

What and where is this? 2-461



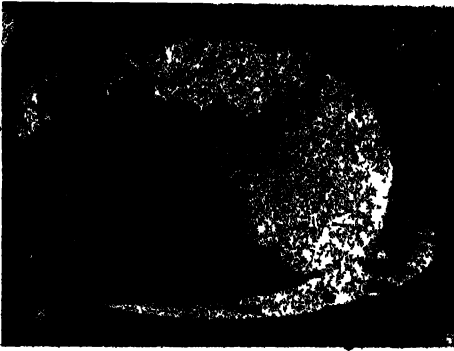
What? 4-502

Who? 3-87

What is this? 1-160

What is he doing? 1-250

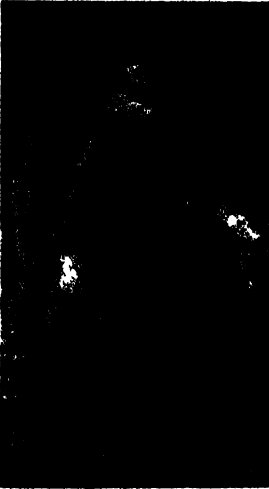
PICTURE QUIZ



Is this a Christmas cake ? 1-304



And what is this, then ? 6-213



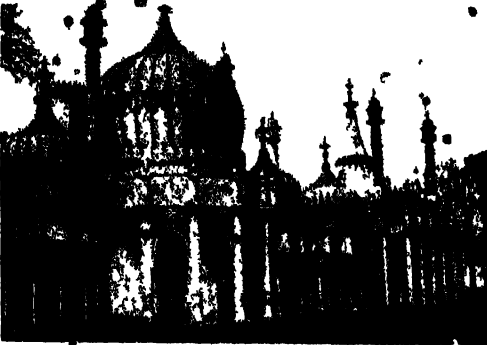
Who is it ? 1-341



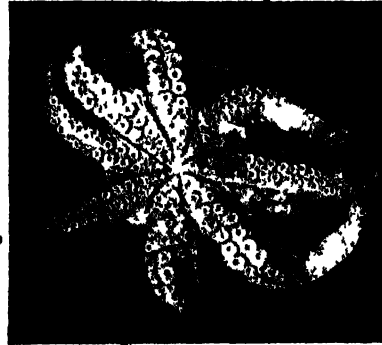
What are they doing ? 2-445



Who painted him ? 4-121 f.



What and where is this ? 2-70



What is this creature ? 3-13



And this ? 3-478



What is this ? 2-385



Name of these birds ? 3-502

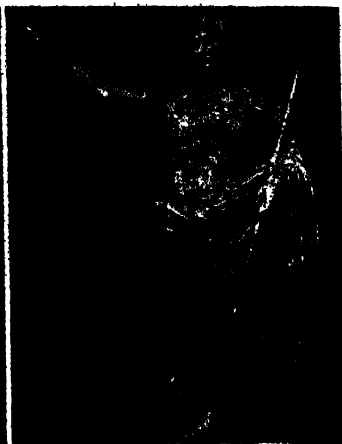


What are they doing ? 4-510

PICTURE QUIZ



Who was she ? 1-311



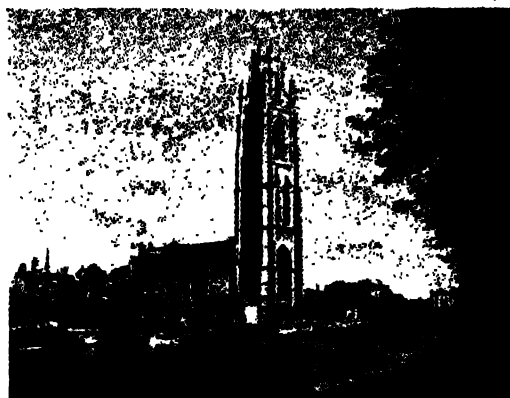
Who was he ? 1-309



What sculpture ? 5-47



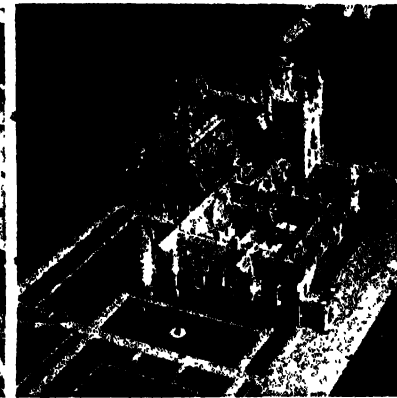
What costume ? 8-95



Where is this church ? 2-21



Doing what ? 4-192



Can you identify it ? 1-357



Loch Ness monster ? 7-177

Where from ? 1-66 What plants ? 5-511



What and where ? 2-462



Who ? 5-122



What creature ? 4-528 I.



Who ? 2-148

PICTURE QUIZ



What insect ? 4-436



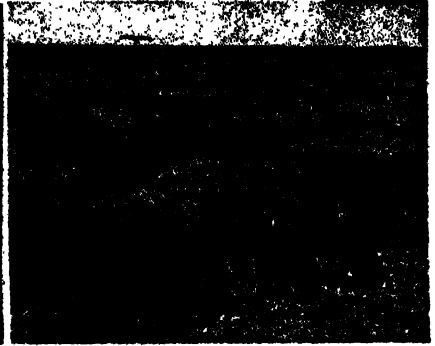
What animal ? 1-241



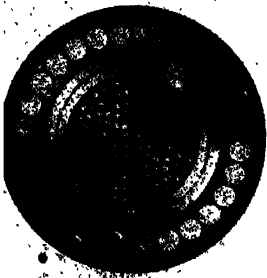
What ? 2-388



What is each of these two men doing ? 2-237 ; 6-124



What birds are these ? 1-266



What do these photographs show ? 2-154



What animals ? 5-55



Who ? 7-156



What is it ? 2-489



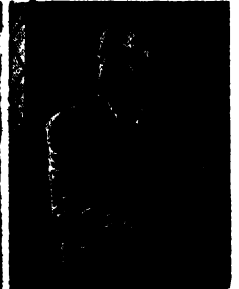
What bridge and river are these ? 2-72



Where are these birds found ? 1-166



Who are these great generals ? 1-98 ; 1-100



CAREERS: ADDRESS LIST

The "Careers at a Glance" section, beginning at Vol. 2, p. 232, gives general information on how to enter the various professions and occupations. Here is a list of useful addresses from which details of conditions and prospects may be obtained.

ACCOUNTANCY

- Institute of Chartered Accountants, Moorgate Place, London, E.C.2.
- Society of Incorporated Accountants and Auditors, Incorporated Accountants' Hall, Temple Place, Victoria Embankment, London, W.C.2.
- Association of Certified and Corporate Accountants, 22 Bedford Square, London, W.C.1.
- Institute of Cost and Works Accountants, 63 Portland Place, London, W.1.
- Institute of Municipal Treasurers and Accountants, 1 Buckingham Place, London, S.W.1.

ACTUARIAL WORK

- Institute of Actuaries, Staple Inn Buildings, London, W.C.1.
- Faculty of Actuaries, 23 St. Andrew Square, Edinburgh.

ADVERTISING

- Institute of Incorporated Practitioners in Advertising, 44 Belgrave Square, London, S.W.1.
- Advertising Association, 1 Bell Yard, Fleet Street, London, W.C.2.

AERONAUTICAL ENGINEERING

- Aeronautical Engineers' Association, 108 Church Street, Croydon, Surrey.

ARCHITECTURE

- Royal Institute of British Architects, 66 Portland Place, London, W.1.
- Institute of Registered Architects, 47 Victoria Street, London, S.W.1.
- Incorporated Association of Architects and Surveyors, 75 Eaton Place, London, S.W.1.

ARMY

- The War Office, Whitehall, London, S.W.1, or local recruiting depots

AUCTIONEERING

- Chartered Auctioneers' and Estate Agents' Institute, 29 Lincoln's Inn Fields, London, W.C.2.
- Incorporated Society of Auctioneers and Landed Property Agents, 34 Queen's Gate, London, S.W.7.

BANKING

- Institute of Bankers, Lombard Street, London, E.C.3.

BAR, THE

- Council of Legal Education, 7 Stone Buildings, Lincoln's Inn, London, W.C.2.

BUILDING

- Institute of Builders, 48 Bedford Square, London, W.C.1.

BUSINESS

- Incorporated Sales Managers' Association, 4 Holborn Place, London, W.C.2.
- Chartered Insurance Institute, 20 Aldermanbury, London, E.C.2.

CHEMISTRY

- Royal Institute of Chemistry, 30 Russell Square, London, W.C.1.

CHEMICAL ENGINEERING

- Institution of Chemical Engineers, 56 Victoria Street, London, S.W.1.

CHIROPODY

- Society of Chiropractors, 21 Cavendish Square, London, W.1.

CIVIL ENGINEERING

- Institution of Civil Engineers, Great George Street, London, S.W.1.
- Institution of Municipal Engineers, 84 Eccleston Square, London, S.W.1.

CIVIL SERVICE

- The Civil Service Commission, 6 Burlington Gardens, London, W.1.

DESIGN

- Society of Industrial Artists, 7 Woburn Square, London, W.C.1.

ELECTRICAL ENGINEERING

- Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2.

ESTATE MANAGEMENT

- Land Agents' Society, 21 Lincoln's Inn Fields, London, W.C.2.
- Royal Institution of Chartered Surveyors, 12 Great George Street, London, S.W.1.

HOSPITAL SERVICE

- Institute of Hospital Administrators, 75 Portland Place, London, W.1.
- Institute of Almoners, 42 Bedford Square, London, W.C.1.

LIBRARIANSHIP

- Library Association, Chancery House, Malet Place, London, W.C.1.

LOCOMOTIVE ENGINEERING

- Institution of Locomotive Engineers, 28 Victoria Street, London, S.W.1.

MARINE ENGINEERING

- Institute of Marine Engineers, 85 Minories, London, E.C.3.

MECHANICAL ENGINEERING

- Institution of Mechanical Engineers, 1 Birdcage Walk, London, S.W.1.

MEDICINE

- General Medical Council, 44 Hallam Street, Street, Portland Place, London, W.1.

MERCHANT NAVY

- Shipping Federation, 52 Leadenhall Street, London, E.C.3.

METALLURGY

- Institute of Metals (Incorporated), 4 Grosvenor Gardens, London, S.W.1.

MINING ENGINEERING

- Institution of Mining Engineers, 436 Salisbury House, London, E.C.2.

CAREERS: ADDRESS LIST (concluded)

NURSING

General Nursing Council, 23 Portland Place,
London, W.1.

OFFICE MANAGEMENT

Office Management Association, 58 Victoria
Street, London, S.W.1.

OPTICAL WORK

British Optical Association, 65 Brook Street,
London, W.1.

PHARMACY

Pharmaceutical Society of Great Britain, 17
Bloomsbury Square, London, W.C.1.

PHOTOGRAPHY

Institute of British Photographers, 48 Gordon
Square, London, W.C.1.

PHYSICS

Institute of Physics, 47 Belgrave Square,
London, S.W.1.

POLICE

Metropolitan Police Office, New Scotland Yard,
London, S.W.1. Otherwise, Chief Constable
of the Force it is desired to join.

PRODUCTION ENGINEERING

Institution of Production Engineers, 10 Chester-
field Street, London, W.1.

PURCHASING

Purchasing Officers' Association, 140A Queen
Victoria Street, London, E.C.4.

RADIOGRAPHY

Society of Radiographers, 32 Welbeck Street,
London, W.1.

ROYAL AIR FORCE

Air Ministry, Adastral House, Kingsway,
London, W.C.2.

ROYAL NAVY

The Board of Admiralty, Whitehall, London,
S.W.1.

SECRETARYSHIP

Chartered Institute of Secretaries, 14 New
Bridge Street, London, E.C.4.
Corporation of Secretaries, 22 John Adam
Street, London, W.C.2.

SHIPPING

Institute of Export, Export House, 14 Hallam
Street, London, W.1.

SOLICITOR

The Law Society, 113 Chancery Lane, London,
W.C.2.

TECHNOLOGY

City and Guilds of London Institute (Exams-
Section, Depart. of Technology), 31 Brechin
Place, London, S.W.7.

VETERINARY SURGERY

Royal College of Veterinary Surgeons, 10 Red
Lion Square, London, W.1.

"BOOK OF KNOWLEDGE" BIOGRAPHIES

A Classified List for those who like to read about Famous Men and Women

THIS list contains the names of all those whose lives and achievements have been recorded in Volumes 1 to 7, under their own separate headings. In each instance the name as printed below in capital letters is the one to turn to in order to find the article: for example, Julius CAESAR will be found under Caesar, not under Julius. Each name is given only once in this list, although many of them might well be under two or more. Thus Napoleon I is placed among the ROYAL PERSONAGES, and his name is therefore not repeated among the WARRIORS—and there are several other examples. Some have defied classification, and are therefore placed under that convenient heading, MISCELLANEOUS.

To read through the list is like passing swiftly through the world's Hall of Fame. These are the men and women who, through successive ages, have helped more than any others to mould our civilization directly or indirectly into its present shape. A few, indeed, may have left an evil mark behind them. But without a doubt the majority have wrought great and lasting good, and nothing could be more stimulating than a study of their lives and their varied contributions to history, to knowledge, and to the enrichment of human existence.

Remember that history is never finished. The futures will certainly breed as many great and famous men and women as the past has done. Some day, perhaps, in some edition of THE BOOK OF KNOWLEDGE yet to be printed, such a list as this may include the names of some who now, as boys and girls, are reading these lines. Will your name be among them? Who can tell? Meanwhile you may find satisfaction in taking as a motto the often-quoted lines of Joseph Addison: "Tis not in mortals to command success, But we'll do more: Sempronius; we'll deserve it."

RELIGIOUS TEACHERS AND LEADERS

JESUS CHRIST.

St. ALBAN, St. AUGUSTINE (two), BECKET, St. BLNEDICT, BONIFACE, General, BOOTH, CALVIN, CRANMER, Father DAMIEN, George FOX, FRANCIS of ASSISI, GREGORY, GREENFELL, HUSS, KNOX, LATIMER, LAUD, LOYOLA, LUTHER, NEWMAN, St. PATRICK, St. PAUL, PENN, St. PETER, PIUS I-XII, SAGONAROLA, SWIDENBORG, WESLEY, WYOLIFFE, FRANCIS XAVIER, ZWINGLI.

BUDDHA, CONFUCIUS, MAHOMET

ROYAL PERSONAGES

British: Her Majesty Queen ELIZABETH II, His Royal Highness PHILIP, Duke of Edinburgh; Her Majesty Queen ELIZABETH the Queen Mother, Princess MARGARET.

ALBERT (Prince Consort), Queen ALEXANDRA, ALFRED the Great, THE BLACK PRINCE, Anne BOLEYN, BRUCE (Scotland), CANUTE, CHARLES I and II, EDWARD I-VIII, ELIZABETH I, GEORGE I-VI, HAROLD I and II, HENRY I-VIII, JAMES I and II, JOHN, MARY I and II, Queen MARY (consort of George V), Mary Queen of Scots, RICHARD I-III, STEPHEN, VICTORIA, WILLIAM I-IV.

Others: ALFONSO XIII (Spain), CHARLEMAGNE, CHARLES (Kings of France), FREDERICK the Great (Prussia), HENRY IV (France), ISABELLA of Castile, IVAN (Russia), JOSEPHINE (France), LEOPOLD I-III (Belgium), LOUISE (Kings of France), MARIA THERESA (Austria), MARI ANTOINETTE (France).

NAPOLEON I (France), NAPOLEON III (France), NICHOLAS I and II (Russia), PETER the Great (Russia), PHILIP II, IV and VI (France), PHILIP II and V (Spain), WILLIAM I and II (Germany), WILLIAM the SILENT (Princes of Orange).

Roman Emperors: AUGUSTUS, CALIGULA, CONSTANTINE, MARCUS AURELIUS, NERO, CLEOPATRA (Egypt).

POLITICAL FIGURES

British: C. R. ATTLEE, Lord AVERBURY, Ernest BEVIN, BOLINGBROKE, John BRIGHT, BURKE, The CECIL Family, THE CHAMBERLAIN Family, CHATHAM, Sir Winston CHURCHILL, COBDEN, CROMWELL, DISRAELI, Anthony EDEN, FOX, GLADSTONE, HAMPDEN, Warren HASTINGS, LLOYD-GEORGE, Ramsay MACDONALD, Sir John ALEXANDER MACDONALD (Canada), Simon de MONTFORT, Sir Thomas

BIOGRAPHIES (concluded)

MOORE, OXFORD AND ASQUITH, FALKENSTON, PEEL, PIRI
RHODES, SMUTS (South Africa), STRAFFORD, WALPOLE,
WOLSEY.

Others : d'ANNUNZIO (Italy), BENEŠ (Czechoslovakia), BISMARCK (Germany), BOLIVAR (S. America), DANTON (Fr. Revolution), DE VALERA (Ireland), FRANCO (Spain), GANDHI (India), HITLER (Germany), THOS. JEFFERSON (U.S.A.), JINNAH (Pakistan), KEMAL ATATÜRK (Turkey), LENIN (U.S.S.R.), LINCOLN (U.S.A.).

MACHIAVELLI (Italy), JAN MASARYK (Czechoslovakia),
THOS. MASARYK (Czechoslovakia), MAZARIN (France),
MAZZINI (Italy), MIRABEAU (Fr. Revolution), MTS-OLINI
(Italy), NEHRU (India), DANIEL O'CONNELL (Ireland),
RICHELIEU (France), ROBESPIERRE (Fr. Revolution),
FRANKLIN D. ROOSEVELT (U.S.A.), STALIN (U.S.S.R.),
TALLEYRAND (France), TREUTSKY (U.S.S.R.), HARRY S.
TRUMAN (U.S.A.), WASHINGTON (U.S.A.), WOODROW WILSON
(U.S.A.).

Ancient : AGRICOLA, ARISTIDES, LUCIUS JUNIUS BRUTUS, MARCIUS JUNIUS BRUTUS, CATO, CICERO, CININNATUS, DEMOSTHENES, PERICLES.

SCIENTISTS AND NATURALISTS

AESCLAPAPIUS, AGASSIZ, Mary ANNING, ARCHIMEDES,
AUDUBON, Roger BACON, BOYLE, BRAHE, Brewster,
BUFFON, BUNSEN, CAVENDISH, COPERNICUS, Marie CURIE,
CUVIER, DALTON, DARWIN, DAVY, FAHRE, FARADAY,
FLEMING, FRED, GALILAO, GALVANI, HARVEY, John
HUNTER, HUNLEY, JEANS, JENNER, JOULE, JUNG, KELVIN,
KEPLER, LAVOISIER, LINNAEUS, LISTER, LODGE, Clerk
MAXWELL, MENDEL, MENDELÉEV, NEWTON, PASTEUR,
PRISTLEY, RAMSAY, RUTHERFORD.

INVENTORS

ARKWRIGHT, BELL, BLERIOT, BRUNEL, CARTWRIGHT
CANTON, CROMPTON, EDISON, FRANKLIN, FULTON, HAR
GRAVES, McADAM, MARCONI, MORSE, STEPHENSON
TELFORD, TREVITICK, WATT.

MEN OF BUSINESS

AUSTIN, BEAVERBROOK, CAMROSE, CARNEGIE, FORD,
ILIFFE, KEMSLEY, NORTHCLIFFE, NUFFIELD.

EXPLORERS AND NAVIGATORS

BAKER, BABCOA, BOUGAINVILLE, BURTON, BYRD, CABOT
COLUMBUS, COOK, CORTES, DRAKE, SIR J. FRANKLIN
FROBISHER, HUDSON, LIVINGSTONE, MABELLAN, NANSEN
MUNGO PARK, PEARL, MARCO POLO, RALEIGH, SCOTT
SHACKLETON, STANLEY, VASCO DA GAMA

WARRIORS ON LAND AND SEA

ALEXANDER the Great, ALEXANDER of Tunis, ALLAN, BLAKE, BLÜCHER, BOADICEA, JULIUS CAESAR, CHARLES MARTEL, CHIANG KAI-SHEK, CLIVE, COLIGNY, EISENHOWER, FOCH, COLLINGWOOD, de GAULLE, GORDON, GRENVILLE, HAIG, HANNIBAL, HAWKINS, HEReward the Wake.

"Stonewall" JACKSON, JELLIHOE, JOAN OF ARC, JOHN PAUL JONES, KITCHENLB, LAFAYETTE, T. E. LAWRENCE, LEE, MACARTHUR, MARK ANTONY, MARLBOROUGH, GEORGE MARSHALL, MONTCALM, MONTGOMERY, MONTROSE, MOORE, MOUNTBATTEN, NELSON, POMPEY, PYRRHUS, ROBERT SALADIN, Wm. WALLACE, WELLINGTON, WOLFE.

REFORMERS AND ECONOMISTS

ARNOLD, FROEBEL, Mme. MONTESSORI, ROUSSEAU, ALBERT
SCHWEITZER, SHAFESBURY, ADAM SMITH.

WRITERS

British : ADDISON, JANE AUSTEN, BYRON, BARRIE, BELLOU, BENNETT, BLAKE, BORROW, BOSWELL, BRIDGES, THE BRONTES, RUPERT BROOKE, ELIZABETH BARRETT BROWNING, ROSE BROWNING, JOHN BUCHAN, BUNYAN, BURNS, BYRON, CAEDMON, CARLYLE, LOUIS CARROLL, CHATTERTON, CHAUCER, CHENSTERTON, CORBETT, COLARIDGE, CRAD, COWPER, DEFON, DE QUINCEY, DICKENS, CONNOR DOYLE, DRYDEN, GEORGE ELIOT, EVELYN, FIELDING, SIR JAMES FRASER, GALSWORTHY, MRS. GASKELL, GILBERT (SIR W. S.), GOLD-SMITH, GRAY, RIDER HAGGARD, HARDY, HODGKINS, SAMUEL JOHNSON, BEN JONSON, KEATS, KINGOLEY, KIPING, LAMB, LEAR, LYTTON, MACAULAY, MALORY, MARLOWE, CAPT MARRYAT, MARSHFIELD, MILNE (A. A.), MILTON, W. MORRIS, PEPPY, POPE, BEATRICE POTTER, PRIESTLEY (J. B.) RUSKIN, SCOTT, SHAKESPEARE, SHAW, SHELLEY, SHERIDAN, SIR PHILIP SIDNEY, SOUTHEY, SPENSER, STEELE, STEVENSON, SWIFT, SWINBURNE, TENNYSON, THACKERAY, TROLOPE, Wm. TYNDAL, HORACE WALPOLE, ISAAC WALTON, WELLS, WORDSWORTH.

American : LOUISA MAY ALCOTT, FEMMORE COOPER
EMERSON, HAWTHORNE, WASHINGTON IRVING, LONGFELLOW,
POE, MARK TWAIN, WHITMAN.

French : BALZAC, DAUDET, DUMAS, FROISSART, HUGO, LA FONTAINE, MOLIÈRE, MONTAIGNE, RACINE, Jules VERNE, VILLON, VOLTAIRE.

• **German :** A KEMPER, GOETHE, The Brothers GRIMM.
HEINE, SCHILLER.

Classical: AESCHYLUS, AEGOP, ARISTOPHANES, HERODOTUS, HOMER, HORACE, LIVY, PLUTARCH, SOPHOCLES, THUCYDIDES, VIRGIL, XENOPHON.

Others : HANS ANDERSEN, CERVANTES, DANTE,
DOSTOEVSKY, IBSSEN, MAETERLINCK, MARX, OMAR KHAYYAM
TOLESTOV

PHILOSOPHERS AND MATHEMATICIANS

ARISTOTLE, DESCARTES, DIOGENES, EINSTEIN, KANT,
LOCKE, John Stuart MILL, PLATO, PYTHAGORAS, SOCRATES

ARTISTS, ARCHITECTS, CRAFTSMEN

Robt. ADAM, ALDUS MANUSCRIPT (printer), BOTTICELLI, BRUEGHEL, CEZANNE, CONSTABLE, COROT, COTMAN, DÜRER, EPSTEIN, GAINSBOROUGH, GRINDING (GIBBONS) (woodcarver), GIOTTO, GUYA, EL GRECO, FRANK HALL, HOGARTH, HOLBEIN, INIGO JONES, LE CORBUSIER, LEONARDO DA VINCI.

MICHELANGELO, MILLAIS, MILLET, JOHN NASH (architect),
PHIDIAS, RAPHAEL, REMBRANDT, REYNOLDS, RODIN,
RUBENS, TITIAN, TURNER, VAN DYCK, VAN EYCK, VAN
GOGH, VELAZQUEZ, VERMEER, WREN

COMPOSERS OF MUSIC

BACH, BEETHOVEN, BRAHMS, CHOPIN, DEBussy, FETTER,
 GRIEG, HANDEL, HAYDN, LISZT, MENDELSSOHN, MOZART,
 PADEREWSKI, PURCELL, SCHUBERT, SCHUMANN, SIBELIUS,
 JOHANN STRAUSS, RICHARD STRAUSS, SULLIVAN (see under
 GILBERT AND SULLIVAN), TCHAIKOVSKY, VERDI, WAGNER

MISCELLANEOUS

ABELARD, Edward ALLEYN, BADEN-POWELL, BARNABO BENTHAM, Sarah BERNHARDT, BLONDIN, THOMAS, BLOOD, The BONAPARTE Family, The BORGAS, The BOURGONN, BRADMAN, BRADSHAW, John BROWN, Lancelot BROWN DUCH OF BUCKINGHAM, BUFFALO BILL, JACK CADE, Sir M. CAMPBELL, Charles CHAPLIN.

Wm. DAMPIER, Grace DARLING, Walt DISNEY, Guy
FAWKES, Lady Jane GREY, Judge JEFFREYS, Amy JOHNSON,
Helen KELLER, Wm. KIDD, LINDBERGH, Flora MACDONALD,
the MEDICAL, Sir H. MORGAN, Florence NIGHTINGALE, THOMAS
PAINE, PIZARRO, Wm. TYLER, Richard WHITTINGTON.